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ALABAMA.

Synopsis of the Weather.

The daily reports of the weather, furnished by the War department, which are to be found under our telegraphic ad, are both curious and valuable. The invention of the telegraph has furnished the means of obtaining simultaneous information of the meteorological condition of all parts of the country, and the facts thus accumulated have been systematized into a weather code, as positive as any department of physical science. The result is that the movements of storms are very accurately predicted, both as to their direction and rate of motion; and thus the mariner, the merchant, and the husbandman are forewarned what they may expect twenty-four hours beforehand. The recent accurate predictions of the vicissitudes of the weather here, illustrate the workings of the system.—*Mobile Register*, February 26, 1872.

CALIFORNIA.

Weather Predictions.

On Sunday last a dispatch was received from the headquarters of the Weather Signal Corps, at Washington, stating that the barometrical reports from California indicated that a storm might be expected on Monday. The storm had already begun, and was pretty general throughout the State.

being especially severe in portions of the Sacramento Valley, where it was accompanied by an unusual amount of thunder and lightning. This is the second time the present season that storm predictions from Washington, where observation from all parts of the Union are received and compared, have been promptly realized. Meteorology is a science yet in its infancy, the great multitude of facts and comparisons necessary to give it an exact character not having been all obtained and worked up over a sufficient portion of the earth's surface. But it is making progress, and the facts to which we have referred indicate what valuable results it may produce for mankind hereafter.

Commander Maury, late of the U. S. Navy, has, by his researches in the "Physical Geography of the Sea," conferred an incalculable benefit upon all who do business on the mighty deep. He demonstrated to a mathematical accuracy the certainty and course of ocean currents; and, despite his unfortunate connection with the rebellion, his name will occupy a prominent place in American biography. Admiral Fitzroy, of England, was one of the first to make known that similar currents existed in the air, and under his direction the Fitzroy storm signals were established at all the out-ports. These gave warning to mariners, often twenty-four hours in advance, that there would be danger in putting to sea; and so thorough were his investigations on the matter, and so correct his deductions, that the people in the East Indies have been warned of an approaching storm three days before it occurred, and made preparations accordingly. He ascertained that currents of air, like water in the ocean, move in specified directions, and it is deeply to be regretted that the strain upon his brain, in these researches, proved too much for him, that his mind gave way, and that in a moment of temporary aberration he took his own life, just as he was beginning to understand the law of these storm currents. The good work he began is, however, being carried on by other minds, on this Continent and in England.

The prognostication from Washington on Sunday, and its

verification, shows the progress already made, and in view of the approaching large commercial interests, which are to be centered on this coast, it becomes an important question whether storm signals should not be established more generally through the State, and down the coast, giving indications which may be the means of saving life and property. —*San Francisco Evening Bulletin*, April, 1871.

Meteorological Observations.

At the last session, Congress authorized the Secretary of War to “provide for taking meteorological observations at military stations in the interior of the continent, and at other points in the States and Territories, and for giving notice to mariners on the Northern lakes and on the sea coast, by telegraph and marine signals, of the approach and force of storms.”

The act went into practical operation in the month of November, 1870. The object of the resolution was to organize a complete system of storm observations. The system meets a present requirement of commerce; ship-owners, insurance companies and transportation companies are interested therein. By means of this service ship-owners can judge of the probable time of arrival of their steamers, as well as of the safety of their property at sea. The observations indicate the approach of storms of wind and rain, and the variations of temperature, establish generally reliable rules in regard to their character and peculiarity, and aid the scientific world to ascertain whether they are governed by any fixed law of nature. They make known, at the same instant, to all the people of the country the character and variation of the weather. Such knowledge assists greatly in protecting life, and every description of property, whether at sea or on shore, from the dangers of gales, and cannot fail to prove of great benefit to com-

merce. Already that benefit has been realized. In the month of December last, a bulletin from the Meteorological Department announced a storm that left the Rocky Mountains on the previous day and was traveling eastward at various points on the Lakes. Vessel-owners and sailors were able to make provision against disaster before the storm arrived. I am happy to say that a signal station has been established at this port under the able direction of Sergeant Samuel P. Carusi, and that a committee has been appointed by this Chamber, by request of the War Department, to coöperate with him.—*Daily Alta California*.

The Signal Service, established by the War Department, has already made some important discoveries in meteorology. We learn from the *Washington Star* that prognostications of the weather by the Signal Service officers in that city are so constantly verified that the caption "predictions" would better suit them than the unpretending heading of "probabilities" usually employed. It cites, in verification of what it advances, that in the "probabilities" for May 2d, "Cloudy weather, with light rains along the Atlantic coast," was predicted for the following day—a condition which was fully realized at the time specified. It has long been thought that the facility which the telegraph furnished for the generalization of weather observations, taken at the most widely separated points, would enable us to penetrate the secrets of the upper air, so that the traveler, the husbandman, and the excursionist will hereafter be relieved of all anxiety as to the atmospherical conditions by which he may be confronted. We have a branch of the Signal Corps in this city, and the observations made are duly reported in the *Alta*. We have not much to speculate upon in this part of the world in summer. We know pretty thoroughly for six months what is before us; but next winter we are satisfied that great and important discoveries will be made.—*Daily Alta California*, May 15, 1871.

The Storm Prediction.

The Sacramento *Union* of yesterday has this to say about it: "The storm that commenced a week ago was predicted from indications telegraphed from this coast to the Signal Service Officer at Washington. We were notified by despatch that a storm of rain, accompanied by high wind, might be expected. The storm came according to the prediction, and within thirty-six hours after the warning. As in the case of the great land cyclone that swept the whole area of the Atlantic States and Mississippi Valley on the 14th of November, the predictions of the Signal Service Officer were verified to the letter. After the fury of the storm was apparently spent, the condition of the winds and the unparalleled fall of the barometer indicated another storm, and the Signal Officer at San Francisco hazarded the prediction of another storm on his own account. Perhaps he had not the advantage of knowing the condition of the atmosphere at all points along the coast, and was not, therefore, well enough posted to be as sure as he would have been with more advantages. But the facts he did have presaged a storm, and he said so. Some little sunshine and changes in the wind turned popular sentiment against our local weather prognosticator, and some of the press indulged in harsh or uncomplimentary language toward him. He was pronounced a bilk, and worthy of removal. Nevertheless, he predicted a storm that came as true to time as the other. The *Alta* seemed to think it was necessary to receive warning from Washington to be worthy of attention. All the facts that indicate a meteorological disturbance on this coast are gathered here and transmitted to Washington, and from these the future is foretold. The laws of storms being understood by meteorologists, if the reports from the various Signal Stations on the coast were given the Signal Officer at San Francisco, there is no great reason why he might not foretell storms from the premises as well as his superior officer at Washington. The use of the telegraph renders it

not essential from what point the prophecies are announced; but, in case the telegraph will not work—as often happens in stormy periods—we see no reason why a local observer of meteorological phenomena might not warn the people of coming storms on his own account. We hope he will, in spite of the cries of ‘canard’ from the weather-wise in their own conceit.”—*Daily Morning Call*, December 23, 1871.

CALIFORNIA STATE BOARD OF AGRICULTURE,
Sacramento, December 27, 1871.

GARRICK MALLERY,
Captain and Acting Signal Officer,
Washington, D. C.

Dear Sir: We have lately been visited by two severe storms on this coast, the first of which was foretold with a degree of correctness, as to time and severity, from your office, that has astonished every one. The latter was also foretold with almost equal correctness, at the San Francisco station. These facts have called universal attention to the value and importance of the service, and created a desire in this vicinity that a station may be established at Sacramento.

In obedience to this desire, the State Board of Agriculture, at a meeting held on the 26th inst., added Dr. T. M. Logan, of this city, to the committee heretofore named. Dr. Logan is one of the best meteorologists in the State, and occupies the office of meteorologist to our Board of Agriculture. It is hoped, if the facilities at the command of the service do not now warrant such establishment here, that Congress will at an early day give it the necessary means.

I am, very respectfully, your obd't servant,

J. H. HOAG,
Secretary Meteorological Committee of Cal. State Agricultural Society,

CONNECTICUT.

NEW LONDON, CONN.,
June 8th, 1871.

Bvt. Capt. H. W. HOWGATE,
Acting Signal Officer and Assistant.

DEAR SIR: I have the honor to acknowledge the receipt of the new pamphlet of instructions for the guidance of Signal Observers.

I have also to add that, in our judgment, in view of the greatly increased duties to be performed by the Observer at this station, Sergt. Brinsmade is in pressing need of an assistant. I have the pleasure to add my testimony, to that of many others, in favor of his industry and fidelity in the discharge of his now arduous duties.

I am, sir, very respectfully, your obedient servant,

(Signed:)

R. S. RAYMOND,
Chairman Met. Com., Bd. Trade.

DISTRICT of COLUMBIA

THE prediction of fair weather yesterday, made by the Signal Corps of the army, proved correct, and demonstrates the wisdom of the system of giving daily a weather synopsis, such as we printed yesterday, and also give in another column to-day. We shall hereafter try to find room for these daily reports, especially when it is particularly desirable to know the probable character of the weather in advance.—*Daily Chronicle*, Feb. 21, 1871.

STORM SIGNALS.—Congressman R. J. Haldeman, of Pennsylvania, writes to the Secretary of War as follows: “The intelligent farmers of the county are beginning to take a deep interest in the Meteorological Reports daily published by the Department, and would be glad to have them supplemented by some effective system of storm signals. As Carlisle Barracks are situated in the centre of one of the richest and most cultivated valleys of the United States, I earnestly urge it as a suitable place for making the necessary preliminary experiments.” This refers to the plan of storm signals, by means of telegraph and cannon, for the benefit of agriculture and commerce, to be tested first at military posts.—*Daily Patriot*, June 14, 1871.

The Weather—Predictions of the Clerk Thereof.

On Saturday morning, about two o'clock, as “the clerk of the weather” entered the *Chronicle* office with his usual report of the condition of the barometer at all the leading points within the broad domain of Uncle Sam, he responded to the usual inquiry, “How is it going to be?” by saying “Rain.” The uninitiated must not suppose that allusion is meant to the mythical clerk so often referred to by old chroniclers. The one mentioned is of veritable flesh and blood, and comes about the time named every morning as regularly as the hand of the clock points to that hour. He brings with him the result of calculations, made in the War Department, the report of barometrical changes at different points, which have been received by telegraph, and from which are made up, under the head of “Probabilities,” the condition of weather likely to prevail in the different sections of the country for the next twenty-four hours. These predictions have been so generally fulfilled that they have come to be regarded as certainties, and their publication through the press has been found very useful.

At the time above mentioned the weather was mild and clear, and but little attention was paid to the prediction of “the clerk of the weather.” At 7 o’clock in the morning, and for how long previous the writer knoweth not, a heavy rain was falling, which continued for some hours. This was a blessing in more ways than one, as it cooled the atmosphere, refreshed and invigorated all surrounding vegetation, and last, though not least, gave us what our city rulers have neglected—clean streets. These are not blessings in disguise, they have been plain and palpable to the different senses, and all who think have been grateful for them.

The atmosphere throughout yesterday and Saturday was somewhat cloudy and threatened rain, but it did not come, and so remained cool and pleasant, enabling all to indulge in out-door exercise.

Large numbers left yesterday for rides and walks into the suburbs, and many went boating and fishing on the river. The popular steamer *Lady of the Lake* carried a goodly number on her forty-mile trip down the river. These Sunday afternoon excursions are always largely patronized, as they afford great accommodation at a moderate cost.—*Daily Chronicle*, July 3, 1871.

Weather Telegraphy and the Press.

The Tree of Science, as it has been well said, has its branches in the air, but its roots are in the earth. It is, indeed, the glory of modern science, and its charter of respect and observance, that, while it fearlessly grapples with the most far-reaching and recondite problems of human nature, and of universal nature, it does so always in a practical spirit, and with a view to contribute something towards the amelioration of man’s condition, and the elevation of his place in the scale at once of enlightenment and of well-being. It is this practical humanitarian position of modern science which

makes its existence a guaranty of democratic progress, and its pursuit almost a religion. The astrology which was the amusement of kings, the sport of the curious, the handmaid of superstition, has now, in the guise of astronomy, and even while reaching into the remotest distances of the stellar spaces, and leaping off into magnificent generalizations, which are almost appalling in their sublimity, come to be the fellow of the practical arts and handicrafts, the willing servant of commerce, the wise counsellor of ploughman and sower. That alchemy which was the vain folly of madmen and the delirious extravagance of enthusiasts, has grown into a science of chemistry, which, while seeking to do no less than decompose and recompose the whole material creation, is content to make itself practically useful in our kitchens and our workshops, in our factories and our fields. This it is which marks the difference between ancient and modern science; between John Kepler, exercising all his unequalled powers of theory and induction, in casting nativities for selfish Wallenstein, and Benjamin Franklin, devising conducting-rods to secure the protection of the humblest dwellings; between Helmont, inventing *arbores Dianæ*, and Liebig, inventing a "food for infants."

The recent developments of meteorology are additional instances of this same spirit. No sooner had Redfield ascertained that there was a law of storms than Maury, Fitzroy, Reid, and many others sought to give this law a practical operation in the behoof of commerce and of man's comfort. The recent establishment of a system of weather telegraphy and storm fore-casting, under the auspices of the Signal Service in this country, is but one arc in the great circle of simultaneous and connected observations all over the globe, by means of which meteorologists expect to wrest his secret from the "tyrannous and strong" storm-blast, and to convert the mysterious problems of tempest and of calm, of fog and mist, of cloud and clear, into apt servants and ready ministers of man and man's improvement. The little column of

figures and plus and minus signs, which occupies a corner in our papers, may not strike the careless observer very forcibly,

“At first it seemed a little speck,
And then it seemed a mist;
It moved and moved, and took at last
A certain shape, I wist!”

but to those who reflect upon “the small beginnings” in which the greatest things of modern culmination have originated, it will seem to be a very important matter indeed. When Lieutenant Maury began to examine the log-books of sea-going vessels there were few persons who suspected he would be able to map out such sailing directions as would shorten the voyage from New York to California thirty days. In the same way, this weather telegraphy, which begins by simply chronicling a few daily observations of barometer and thermometer, is assuredly destined to develop into a science of meteorology, which will empower the expert to forecast atmospheric disturbances as surely as the astronomer can predict eclipses. In this view of the case, this nascent science is the forerunner of the most important knowledge man can hope to achieve in the present age; that knowledge which will enable him not only to apply the phenomena of external nature to his service in commerce, but also to appropriate it for the uses of agriculture, for the destruction of disease, and for the correction and equalization of those very phenomena themselves.

It is in these respects that the weather telegraphy has an unsuspected, but most important and intimate relation with the press—a relation, indeed, of the broadest and most extensive reciprocity. As soon as there shall be established anything like a system of weather forecasting, the whole world will require to be provided with daily information upon the subject, so that the farmer may be advised about seed time and harvest, about ploughing and mowing, about marketing and staying at home, as well as the sailor about when to reef and when to shake out reefs. This information can only be disseminated in one way—through the

medium of the daily press. Hence, there will come a time, and it is not so long distant neither, when it will be as much a matter of course for men of every occupation to read their paper as to eat their breakfast. There will come a time when the agriculturist, instead of cocking his weather eye towards the horizon, and snuffing the breeze like a horse, will send to the post office and seek in his daily paper what the scientific observers say in regard to the fitness of the weather for his proposed industries during the day. The immense future of the press, under such circumstances, cannot be prefigured. But the mere statement of such a thing as possible makes it obligatory upon journalism in every form, upon the simplest principles of reciprocity, to advance in every way the interests and developments of meteorological science, and to give the freest and widest circulation to the facts which observers in its field think it important to have disseminated.—*Daily Patriot, May 4, 1871.*

FORTY-FIRST CONGRESS, U. S. HOUSE OF REPRESENTATIVES,
Washington, D. C., January 23, 1871.

SIR: I have the honor to forward the enclosed application from Manitowoc, Wisconsin, on Lake Michigan, in relation to Storm Signal Stations. If your Bureau is extending the Signal Stations, I would recommend that Jacob Leeps be appointed for a station at that point on Lake Michigan, if consistent with the regulations of the War Department.

I am, sir, yours truly,

PHILETUS SAWYER.

Brig. Gen. A. J. MYER,
 Signal Bureau,
 Washington, D. C.

MANITOWOC, *Jan. 4th, 1871.*

HON. PHIL. SAWYER, M. C.

DEAR SIR: Last fall I had the pleasure to meet your honor at Mr. Randolph's saloon, and had a conversation with your honor about Storm Stations.

I send your honor a copy of the *Manitowoc Tribune*, wherein an article of a citizen of Manitowoc is published. I endorsed that article, and if the members of Congress should deem it advisable to make more Storm Stations, and make Manitowoc a point, I recommend myself for that office. I made for twenty years meteorological observations at this place, and sent them for thirteen years to the Smithsonian Institution and to the Agricultural Department; and your honor may inquire about my ability and my correctness with Hon. Horace Capron, of the Agricultural Department, and with Prof. Henry, of the Smithsonian Institution. If you can do something in favor of that storm institution and for me, your honor would oblige very much one of the first members of the Republicans.

Yours truly,

JACOB LEEPS,

NATIONAL GRANGE OF THE PATRONS OF HUSBANDRY,
Washington, D. C., July 3, 1871.

CHIEF SIGNAL OFFICER,
War Department.

SIR: Our organization, consisting of farmers, takes a deep interest in the meteorological reports of the Department, and we desire not only to secure the benefits to be derived from the same, but to give the Department all the aid possible in transmitting the information in the rural districts.

Will you please inform me what plan will be adopted for communicating the daily reports to farmers remote from telegraph stations?

We have considered the subject, but find that signals which might serve the purpose on prairies would have objections in timbered and mountainous sections.

No doubt a system has been devised; if so, and it meets your favor, we shall be pleased to be made acquainted with it. If, through our subordinate granges, we can be of any service to you, please inform me in what manner.

Yours respectfully,

O. H. KELLEY,
Secretary National Grange.

TREASURY DEPARTMENT, INTERNAL REVENUE BUREAU,
Washington, February 15, 1871.

My dear General:

I am in receipt this morning of the "War Department Weather Map," forwarded to me through your kindness. Please accept my thanks for the same.

I am of the opinion that the Weather Signal Service will be of great benefit to the country eventually, and that your services in establishing the system will be fully appreciated when it shall become more generally known.

Very truly yours,
(Signed,) A. PLEASANTON.

Gen. A. J. Myer,
Chief Signal Service.

GEORGIA.

The Signal Service.

A most beautiful illustration of the value of the service was given last month. The tremendous storm which wreaked its fury on San Francisco on the 21st of February was closely tracked to Corinne, Utah; across the Rocky Mountains to Cheyenne and Omaha, and storm warnings of its approach were issued thirty hours in advance of its arrival to Chicago, a longer time to Milwaukee and Cleveland, and two days' forewarning were given to Buffalo and Oswego. The storm which, in crossing the Rocky Mountains, had broken off only the base of its revolving column, ravaged Chicago, Milwaukee, and Cleveland, unroofing and overturning houses; it struck Buffalo and Oswego with great violence in its course, and finally passed out into the Atlantic. Had navigation on the lakes been open, doubtless the forewarning had been the saving of many lives and richly freighted ships.—*Savannah Republican*, March, 18, 1871.

The Weather.

Yesterday opened bright, warm and spring-like, with indications in the clouds of high winds. The clerk of the weather, who is now no myth, prognosticated high winds and rain, which, surely enough, came, catching many unprotected with umbrellas and water-proof arrangements. The storm soon passed over, without damage hereabouts. Just before the storm came on, the temperature rose several degrees and became unpleasantly hot. The streets, which were very dusty, presented a spectacle of numerous whirlwinds of that impal-

pable powder, which was soon laid by the copious showers which followed, and in the evening the atmosphere was cool and pleasant.—*Savannah Republican*, March 4, 1871.

Utility of the Signal Bureau.

The violent storm which prevailed in Florida on Thursday last was predicted from the office of the Chief Signal Officer to extend northwest, with strong east winds and rain on the south Atlantic coast. The storm arrived at 1, p. m., Friday, accompanied with a very heavy rain, doing considerable damage to property, &c.

The Signal Service reports show that at 7.19, a. m., yesterday, when the storm was about leaving us, it gave the city of Charleston a visit, and threatened Wilmington. Later reports show that it is leaving Charleston, and it now remains for the Signal Bureau to continue to trace it. The correct predictions of the Bureau have saved a great many lives and an immense amount of property. Between 7 o'clock on Friday morning last, and the same hour yesterday morning, rain fell to the depth of over eight inches.—*Savannah Republican*, August 20, 1871.

The Storm.

Yesterday was one long to be remembered in Savannah. It is years since our city has been visited by such a storm of wind and rain. The clerk of the weather at Washington predicted from his seat of observations, "a severe storm is probably advancing north-westward, over Florida, which will bring strong easterly winds and rain to the South Atlantic coast." Never was a prediction more fully verified. The wind was slight, accompanied by a light misty rain in the early part of the day, but about noon it commenced increasing

perceptibly and rapidly, until it reached a height that was actually fearful and terrific. The wind blew apparently from every direction, the tops of the trees were whipped about with a force equal almost to a tornado; they bent and whirled like reeds. It was not periodical puffs that would come, and then lull, giving one time to catch breath, but it was one continuous blow without intermission.—*Morning News*, August 19, 1871.

The Weather.

The prognostications of the clerk of the weather have proved "all right." The storm signal displayed from the observatory yesterday told the marine not to go forth, and he did not. A stiff west wind prevailed all day, hurrying dense clouds with some velocity towards the sea. At 4.19 the thermometer stood at 63 degrees, and falling rains and threatening weather have generally prevailed. From our marine reports it will be seen that the gale which struck here last night or early yesterday morning, prevailed along the Southern Atlantic coast. At this writing the wind is high, and hopeful indications of a cold snap are indulged in.—*Savannah Republican*, November 25, 1871.

ILLINOIS.

The Science of Storms.

The utility and value of the reports of the Signal Service, which give a forecast of the weather, are growing in public estimation, as they are found to be reliable for large districts of country, even if they partially fail in particular localities. The days of weather prophets are about over, and even the "moon wise" will soon find their occupation gone. A greater and more sagacious priesthood has arisen, which, discarding the "horns" of any luminary, make predictions on the rise and fall of the barometer, and have already elevated the profession far above the hazards of the mere guessing. They cast the horoscope from the changing weight of the atmosphere, instead of trusting to the imaginary influence of the planets, and teach men the days when they may safely sow or reap, without danger from storms, instead of wasting time over the fatalities of moonbeams at particular seasons. Many people witnessing the certainties of the predictions of these latter-day prophets, are already taking advantage of them, and the movement will assuredly spread, for it is a demonstrated problem which admits of no doubt.

Among all the improvements of modern times probably none will work more important results than these weather signals. When the recording instruments report a coming storm, it will not answer to trust a clear, blue sky, or the absence of clouds from the horizon. The sailor and the landsman may alike credit the forerunning report, even if it comes from hundreds of miles away. Science will yet pilot mankind through the atmospheric waves, as easily as the ship afloat on the trackless ocean.—*Chicago Post*, May 5, 1871.

Storm Signals and Weather Reports.

Our readers have doubtless observed a great change made recently in the form of the weather reports, which have now been published daily in these columns for about five months past. They have become less ponderous and more practical. The observations made at some thirty different and widely separated points in the United States, by the United States Signal Corps, "for the benefit of American commerce," were at first given in lengthy tabular form. Now we have a short table, and a brief summary of inferences drawn at Washington. This summary is based on a survey of the meteorological conditions obtaining all over the United States, and generally contains a correct sketch of the character of the weather in the immediate future.

It is scarcely possible to glance at these published reports, each day, without becoming convinced of two things. The first is, that meteorology is, at last, entitled to take rank among the physical sciences, notwithstanding the popular impression that it is nothing more than a formidable array of data, without a single valuable conclusion. The second is, that even in its present embryo state, a knowledge of the science of meteorology may be made of practical benefit so great as to be almost incalculable.

The systematic comparison of the atmospheric conditions obtaining at several widely sundered points on this continent, has only been made during about three months past; but a kindred system of storm signals in Europe has been in operation for some years, and has proven of great value, even in England, where the peculiar situation gives a much more changeable and less easily traced set of atmospheric conditions than those met with in North America. On this continent enough of progress has already been made in the study of these correlations to enable us to judge, with almost absolute certainty, of the future movements of those atmospheric disturbances classed under the general head of "storms." It is easy to understand that such knowledge may be made

available in averting many of the disastrous effects of these convulsions, as we can prepare against their advent, both on land and water.

These observations furnish irrefragible proof that the mysterious movements in the ærial envelope of our globe, which have hitherto baffled the sagacity of the wisest, are really referable to a law which can be patiently reasoned out, just as are the tides of the ocean, though the inciting cause of the one may be much more intricate than those of the other phenomenon. There is, however, this difference, that, while we have long ago found out the primary causes of the ocean tide, we can scarcely hope to do more at present than to detect the fact, force, and direction of an atmospheric storm, and make the lightning carry the news in advance of it to those places which lie in the path of the on-moving wave. It is singular, too, that, whereas the tides of the ocean, and the grand ærial tides which we call the "trade winds," travel uniformly from east to west, except as the course is modified by other conditions, the currents of *disturbance* or *derangement* from the normal flow pass almost uniformly in the opposite direction—from west to east. In the case of atmospheric disturbance this general eastward flow is often deflected by a mountain range, or modified by the character of the area over which it travels, just as the water-tide is turned aside or delayed by the interposition of islands, or the shores of continents.

If the earth were unattended by a moon, and had no movement of rotation on her axis, the two oceans of water and air would be nearly quiescent. The continual change of position gives rise to disturbance of equilibrium, and the force of attraction of gravitation continually tends to restore the equilibrium all over the earth's surface. The barometer measures the weight of the atmosphere at any particular place, and the upward and downward movements of the mercury in its tube measures as well as indicates the changes in atmospheric pressure. If, therefore, we find that the barometer shows a greater pressure of air at one place than at

another a few miles distant, we are justified in expecting that there will be a movement of air (wind) from the place where the air is heaviest to the place where it is lighter. And experience proves that this is the case; while the amount of difference between the two premises may naturally be expected to show the force or velocity with which the air will move to recover an equilibrium of weight all over the earth's surface. These movements produce storms of wind, which are generally accompanied by rain of the temperatures if the meeting air masses are unequal, as that causes a precipitation of moisture by a reduction of temperature. It is found that the average rate of movement is seldom more than forty miles per hour, or one thousand miles per day. Inasmuch as the electric flash is practically instantaneous, a storm moving upon us from a distance of one thousand miles could be signalled to us a whole day in advance of its arrival. If there be an atmospheric disturbance on the Missouri river, and a comparison of barometers shows a region of less pressure to the eastward, the vessel-master on the shore of Lake Michigan may have the advantage of twelve hours in which to make all taut and snug in preparation for the anticipated outburst of elemental fury.

Most of these atmospheric waves which pass over this parallel of latitude appear to have their proximate origin on the eastern slope of the Rocky Mountains. They probably come from the tropics, and are deflected eastward across the Mississippi Valley, just as the Gulf Stream is turned back by the shores of Central America, and sent eastward across the Atlantic. And just as the Gulf Stream is a comparatively narrow body of water flowing through a broad ocean, so we find that these atmospheric movements are almost always confined to narrow belts, the length of which may stretch over a large part of the earth's circumference, crossing meridians. The area of the United States, east of the Rocky Mountains, appears to be divided into three grand storm courses, the actual line of the northern one being almost coincident with a curve passing from Cheyenne, through

Omaha and Chicago, thence along the general trend of the lake system and down the valley of the St. Lawrence. Hence the safety of our lake craft is comparatively independent of the disturbances occurring in the two more southern meteorological divisions; and a system of storm telegraphing, which shall cover the points named, will seldom fail to indicate the conditions under which storms may be expected to occur on the great chain of inland lakes.

This is the reason why the newspapers of the northern section are no longer requested to publish the barometirc and thermometric reading of the more southern districts; and a considerable saving is effected in the cost of telegraphing and printing, at the same time that opportunity is afforded for publishing the more important deductions made in Washington from a survey of the whole field.

Thus far the observations made have been of little practical service, except as testing the value of the system of storm signals. But the season of navigation is now open, and we may reasonably hope that the experience of the winter months will enable those who make an understanding comparison of these tables to furnish prognostications of the greater changes in the weather, which will be of untold value to our shipping interests, enabling them to avoid a large percentage of the loss of life and property which has hitherto been an annual concomitant of our lake commerce. It is not too much to hope for, that we shall not only add to the actual wealth of the community by saving these enormous yearly losses, but that the cost of lake transportation will be considerably reduced by a lessening of the rates of insurance commensurate with the diminution of risk.

We may add that the system of storm signals would be of almost equal value to the farmer as to the mariner, could the information be placed at his service. The warning of a few hours would often enable him to avoid the loss of a year's labor in the field.

Every year adds to our stock of that true knowledge which is power. Man may never be able to rise to that position

where he can have cloud or sunshine at his bidding; but, if he can attain to the knowledge of those conditions, so as to be able to take advantage of the very waywardness of the elements, he will then, and then only, be able to justly lay claim to the oft-vaunted title of "Lord of Creation."—*Chicago Tribune*, April 7, 1871.

Storm Prognostics.

The Meteorological Bureau at Washington, established nearly a year ago, to report the movements of the atmosphere in the United States, for the benefit of commerce, have just issued a very valuable pamphlet entitled "Suggestions as to the Practical Uses of Meteorological Reports and Weather Maps." The probable weather of the near future is indicated from the central office at Washington, daily; but it is evident that many atmospheric disturbances occur, which are but feebly felt at any of the forty-seven stations at which these observations are taken by the government officials. By the aid of these condensed rules the work of observing may be profitably undertaken at any place, and the weather probabilities discovered therefor, by comparing the atmospheric conditions at that place with those telegraphed from the government observing stations.

The laws of the movement of storms are not yet fully understood, but enough is known concerning them to enable us to judge with tolerable accuracy of the weather one or more days in advance, if we can only know the present state of the atmosphere over a considerable area. And the rules necessary to this important knowledge are far from being few or intricate, though, of course, they cannot be memorized in a moment.

We do not attempt to present an abstract of the pamphlet, for the double reason that it is so admirably written that a material condensation is impossible, and that a copy may

be obtained from General Myer, the Chief Signal Officer of the United States Army (Washington), free of cost, by any one wishing to use it.

There are two things needed to make the weather observations, now taken daily, really useful to the people. They are :

1. To establish signal stations on the lake shore at suitable intervals, to warn the officers of vessels on the lakes of storms raging in port. Storms often occur near the shores of large bodies of water, when the atmosphere in mid-water is quite calm.

2. To take daily observations of the weather at stations scattered all over the thickly settled portions of the Northwest, at least one in every county in Illinois and adjacent States, so that comparisons could be made and conclusions drawn with reference to the "local disturbances" so frequent in this region, of which the general system takes but little or no account.

It cannot be expected that either of these will be undertaken by the general government. The first-named provision must be made, if at all, by the parties immediately interested in the safety of lake navigation—by the vessel-owners, or the marine insurance companies, or both. The second is of greatest interest to the farming portion of the community, and might be attended to, with advantage, by our county agricultural societies. Both would be found to pay large dividends of profit, in the prevention of loss of life and property on the water, and of damage to crops in the fields.—*Chicago Tribune*, August 8, 1871.

About the Weather.

The great atmospheric wave which came from the western mountains, and traversed to the seaboard early in the week, has subsided, and been replaced by the cold, dry

atmosphere of the northwest plains. A clear sky and invigorating air is the uniform attendant of all winds from that direction. There is an open stretch of two thousand miles without a lake of any considerable size, and hence these winds are always dry and parching. A blow for even a few hours dries up the muddiest streets, and often immerses the city in clouds of dust—a result rarely following from any other point of the compass.

The effect of the trade-winds upon the interior of the continent, has not yet been sufficiently studied. The winters on the Pacific coast are generally almost continuous rains, while the summers are dry and parched, unless locally, and among the mountains. The winds, which seem to blow inland winters, are reversed in the summer, at least at the surface. What effect that may have at the time of changing upon the climate of the great plains at such seasons, has not yet been fully investigated. The mountain barrier is lowest at the north, and a general theory has prevailed that the air currents from about Behring's Straits, following the trend of ranges which turn eastward, give a general direction to the surface winds in nearly all the central northwest States. This current meeting the warm and moist one from the southwest, at some point about Denver, may neutralize the direction of both, and give a western storm to all the country lying eastward. And when that passes the cold and heavier atmosphere would usurp dominion, until the increasing warmth gave a new direction to the winds, which, indeed, are never at rest. When telegraph lines are stretched along the North Pacific railroad, with branches to Lake Winnipeg, British Columbia and Alaska, and the signal stations are attached to the present system, we shall in time arrive at a correct solution of these questions, as a similar arrangement will no doubt attend the completion of the Southern Pacific road, and lines penetrate far into Mexico. When the results from every side are compared the solution will be easy.—*Chicago Evening Post*, April 15, 1871.

The Late Cyclone.

THE RECENT STORM A METEOROLOGICAL WONDER—THE GOOD
WORK OF THE SIGNAL SERVICE BUREAU.

The weather reports of the Signal Office, as given to the press on Tuesday, reveal a meteorological wonder. The whole country east of the Mississippi was then under a cyclone, from Lake Superior to Galveston, and from Savannah to Montreal. Heretofore it has been supposed that a cyclonical storm of such dimensions was impossible. The centre of the rotary storm was in Ohio, the winds blowing in an almost perfect circle around the centre, in a direction against the hands of a watch—the invariable direction in which the West Indian and all other tropical cyclones gyrate. This tremendous revolving gale was predicted and described in all its quadrants fully twenty-four hours before it reached the lower lakes, and thirty-six hours before it fell upon New England. It is a grand stroke of science to be able thus to signal the path and gyration of such an immense gale, whose winds, especially on our lakes and lee shores, are so destructive to the unsuspecting mariner. The great utility of the Signal Service was strikingly illustrated in connection with the recent storm. The day before the storm, under direction of the bureau, cautionary signals were displayed at eighteen of the twenty stations along the line of all the lakes, the whole Atlantic coast from Florida to Maine, and on the coast of the Gulf of Mexico. At every port the warning signal was given from five to fifteen hours in advance of the storm. There could be no better test of the discipline of the Signal Service than this—the storm reaching as it did all the coasts of the United States except the Pacific. Doubtless hundreds of vessels were saved from disaster by being warned of the impending peril hours in advance of its appearance.—*Chicago Tribune*, November 22, 1871.

Quincy as a Signal Service Station.

Why shouldn't Quincy be made one of the stations of the United States Signal Corps? It is a far more important point than several others that are already on the list, including Cairo, Davenport, Keokuk, Knoxville, (Tenn.,) etc., and possesses all the facilities for making the observations required. We have scientific men here who have been accustomed to take note of the height and changes of the barometer, the thermometrical changes, the state of the weather, etc., and the Bridge Company have the necessary means for measuring the force of the wind, probably far more accurately than is now done at a majority of the stations elsewhere. Besides, Quincy is on a parallel, (about 40 degrees,) on which there appears to be no station on the east side of Pittsburg, while there is none this side of St. Louis, on the north. Being the most important city on the river north of St. Louis, and the centre of a rich agricultural region, extending into three States, it would seem to be better entitled to be made a Signal Service station than any other place this side of St. Paul, which has a certain importance as the head of navigation on the Mississippi, and the interests of commerce, agriculture and navigation call for it. Why should not our merchants, steamboat owners, &c., make a move in this direction?—*Daily Whig, Quincy, August 23, 1871.*

WE ARE greatly obliged to Gen. W. M. Dunn for one of the War Department weather maps. It is the first one we have seen. It exhibits at a glance the state of the weather through the whole country on the 6th of December. It is a complete panorama of the observations of the barometer, thermometer, hygrometer, winds, rain, snow, &c., at all Signal Stations, for the day.

The Government is doing a noble work for science, commerce and agriculture. They are demonstrating the fact

that the fickle winds, the fleeting clouds and the changing skies, are all under the dominion of law. The prediction of dangerous storms has already saved to the commerce of the country many times the cost of these observations.—*Greenville Advocate*, December 22, 1871.

Signal Service Bureau.

EDITOR QUINCY WHIG: I have noticed your allusion to the Signal Service Bureau, and the importance of the system of meteorological observations established by that department of the Government. No thinking person can peruse the daily weather reports telegraphed from the central office at Washington without the natural reflection which follows upon the varied interests affected, and upon the almost innumerable ways in which the people are benefitted.

Our shipping interests, not only upon the lakes, but along the Atlantic and Pacific coasts, realize already the value of the precautionary signal system which has been effectually put in operation for the prevention of marine disasters.

Agricultural districts are taking heed of the predictions which now foretell the weather with surprising exactness in the more densely settled portions of the country, and the time of harvest and gathering of crops is, to a great extent, regulated thereby.

Wherever property interests, or outdoor enterprises of any character can be injuriously affected by storms or rain, the value of fore-knowledge is readily perceived.

While we might amplify upon the different business interests which are thus benefitted, we must not lose sight of another result of the Signal Bureau, and that is the immense contribution it makes to the convenience and comfort of hundreds of thousands of our people.

We Americans are usually so absorbed in utilitarian ideas, so disposed to recognize only the consequence of what bene-

fits our pockets and adds to our bank account, that we overlook the value of information which will enable us to avoid little discomforts and annoyances, and make the routine of our lives run more smoothly and pleasantly on.

It is a fact that thousands of persons now govern their movements to a considerable extent by the weather reports in the morning papers.

Ladies preparing to leave their suburban homes for a shopping visit to the metropolis—persons contemplating a day's visit to a country relative or friend, excursion parties, and those "on pleasure bent" among the woodland groves, all look to see whether the bulletin of General Myer foretells clouds and rain, or gives a hope of clear and pleasant weather, and it is in the avoidance of the petty discomforts (sometimes serious from their after results upon the health) which follow a rainy or stormy day, when one has made no preparation, that one of the greatest benefits of the Weather Bureau is realized.

A little sickness escaped, a small annoyance avoided, a happy day made certain—these to the individual seem but small results, but in the aggregate, when we reflect that hundreds of thousands have such experience, millions of dollars could not balance the advantages obtained.

The unscientific visitor can hardly appreciate, much less describe, the variety of ingenious little instruments and the novel mechanism which are employed to register the atmospheric conditions of heat and moisture, the wind currents, and all the weather phenomena which are subjects of careful attention in the national observatory under General Myer's supervision. To this gentleman is due the greatest credit for the ability he has manifested in the department under his charge, and it is to be hoped that Congress will recognize the value of his services by a proper appropriation for the required extension of stations throughout the country. When it is known that seventy per cent. of the weather predictions of the past year have been verified by experience, and when it is known that less than one-fourth the number

of stations or points of observation have been established that are essential to complete any satisfactory information, we must infer that the measures adopted have been instigated by a sagacious and thoroughly competent mind.

When one hundred and fifty stations are in working order in the United States there will be established a systematic observation so thorough, and embracing so vast a territory, that it would seem almost to preclude the possibility of any serious inland or coast disasters from storms or hurricanes.—
Daily Whig, Quincy. R.

ON AND after the first of January next, the Signal Service will report the depth of water at all the prominent points on the Mississippi river and other navigable streams, in the same manner that weather reports are forwarded. The pilots of the steamers will be regularly informed of the stages of water upon the bars, both above and below them, and thus be able to act upon certain information, instead of vague and often interested reports. This arrangement cannot fail to prove an immense convenience, as well as great personal benefit, to the owners of boats, as well as to passengers. The Signal Service has long since demonstrated its utility in foreshadowing storms and giving warning to lake and ocean shipping, and its application in a different form to the river marine grows naturally from its old relations. Secretary Belknap is entitled to great credit for inaugurating the system. The time is not far distant when it will be greatly extended, and the harvesting of crops be about as much governed by its warning as the moving of vessels.—*Chicago Post.*

CAIRO, ILL., *March 17, 1871.*

Hon. JOHN M. CREBS,
Washington, D. C.

DEAR SIR: The enclosed document embodies the official action of the city council of the city of Cairo upon the representations made by you in your letter to Col. S. Stooks Taylor, of the 13th instant.

Hoping that you will succeed in your efforts, as expressed in your letter to Col. Taylor, and that such efforts will not want their due recognition by our citizens,

I am sir, very respectfully, your obedient servant,

(Signed,)

JOHN M. LANSDEN,

Mayor of the City of Cairo.

COUNCIL CHAMBER OF THE CITY COUNCIL,
CAIRO, ILL., *March 17, 1871.*

At a special meeting of the City Council of the city of Cairo, Ills., convened at their chambers, on Friday, the 17th day of March, A. D., 1871, the following preamble and resolutions were unanimously adopted, viz:

“ *Whereas*, From its central location, at the junction of two of the largest rivers in the great Valley of the Mississippi, being a radiating point of a commerce requiring more than 5,000 steamboat arrivals in a year, these reaching frequently as many as thirty in a day; and of railroad and telegraphic communications with every point of the compass, it is highly proper, in the judgment of this body, that a Signal Station for meteorological observations should be established here; therefore, be it

“ *Resolved*, That his honor, the Mayor, be, and he is hereby requested to transmit to the honorable Representative in Congress from this district, a copy of this preamble and

resolution, and to request him to bring to the notice of the honorable Secretary of War the importance of this point as one of the stations alluded to."

A true extract from the minutes.



(Signed,)

JOHN M. LANSDEN,
Mayor.

(Signed,)

MICHAEL J. HOWLEY,
City Clerk.

Washington, D. C., March 21, 1871.

General MYER,
Chief Signal Officer.

Sir: I have the honor to respectfully forward for your consideration, a resolution of the city government of Cairo, Illinois, which I hope may meet the favorable consideration of the Department, and that the Signal Station may be established as prayed for.

I have the honor to be, very respectfully, your obedient servant,

(Signed,)

JOHN M. CREBS.

BOARD OF TRADE OF THE CITY OF CHICAGO,
SECRETARY'S OFFICE,
Chicago, May 27th, 1871.

Bvt. Brig. Gen. A. J. MYER,
Chief Signal Officer, U. S. A., Washington, D. C.

SIR: Your favor of the 20th instant is at hand, and in behalf of this Board, and those interested in our lake interests, I beg to thank you for the efforts you are constantly, and so successfully, making to secure prompt and reliable

reports of weather indications. These reports are daily growing in public favor, and the new arrangement, which so far works very satisfactorily, gives to the matter a largely increased interest. Our committee (now reorganized as per the within card) will be most happy to coöperate with you in any way it may be able to do so, and it is ever at your service and command.

At present I think of but one point to which I would call your attention. Our people are exceedingly anxious for reports from the northern part of Lake Huron, say from one or two points on the west shore and from Mackinac. I think you wrote me that efforts were being made to secure such at an early day, and we trust you may be as happily successful in this as in other matters connected with this Service.

I have the honor to be, very respectfully, your obedient servant,

C. RANDOLPH,
Chairman Committee.

BOARD OF TRADE, CHICAGO, *Dec.* 16, 1871.

To Gen. A. J. MYER,

Chief Signal Officer,

Washington, D. C.

DEAR SIR: Sergeant Mackintosh requests that this Committee communicate to you as to the probable necessity of continuing the cautionary signals during the winter, &c. I would say in behalf of the Committee, that navigation on this Lake is about practically closed for the season; a few vessels may yet be out, and, probably, if the weather is at all favorable for it, vessels will make short trips during most of the winter. After consultation with gentlemen engaged in navigation, I have to report that it is not considered essential to continue the cautionary signals during the winter months,

or say, from now until early in April next. We trust, however, that it is not in contemplation to suspend the daily reports of the condition of the weather at the various points of observation. These are constantly growing in favor, and their absence would be greatly missed.

I have the honor to be, very respectfully, your obedient servant,

CHAS. RANDOLPH,
Chairman Meteorological Committee.

BOARD OF TRADE OF THE CITY OF CHICAGO,
SECRETARY'S OFFICE,

Chicago, February 8, 1871.

Bvt. Brig. Gen. A. J. MYER,
Chief Signal Officer, U. S. A.,
Washington, D. C.

DEAR SIR: In behalf of the committee appointed by this board to confer and coöperate with yourself in matters relating to the subject of meteorological observations for the benefit of commerce, I would take the liberty of saying, that in general, the reports received at this point are very satisfactory, and are rapidly growing in favor. The public are beginning to study and appreciate their usefulness, and we doubt not that on the resumption of lake navigation they will be watched closely by those engaged and interested in our lake business.

The management of the station here is, we think, in very competent hands. Sergeant Mackintosh is, so far as we can judge, faithful, painstaking and competent. I would suggest, however, that an assistant recently assigned to him is somewhat objectionable in that, while ordinarily he seems industrious, and attentive to his duties, he is inclined to the use of stimulents, that at times wholly unfit him for business; a change in this regard would, I think, be for the interest of the service.

We are hoping that at an early day observations may be extended, and some proper system of signals be established at points on the lakes, particularly on Lakes Michigan, Superior and Huron, that will indicate to vessels passing the probabilities of weather from day to day. If such signals could be located at Mackinac they would be of vast benefit. At present we think they might be established at Muskegon, Escanaba, Marquette, and perhaps other points, now in connection with the telegraph, with great and immediately beneficial results, and at moderate expense.

I have the honor to be, in behalf of the committee, your very obedient servant,

CHAS. RANDOLPH,
Chairman of Committee.

IOWA.

Weather Reports.

The new weather office here, and its appointments, were described in this paper on Sunday morning. Pure science has reason to congratulate herself on this advance, that is, on the system of meteorological signals, of which this is a part, as will be understood by those who have closely followed the progress, and the efforts of science to grasp the laws and insualities that govern the changes and features of the weather.

Some may admire the idea of having reports of the weather throughout the country three times a day, who will try to penetrate the mysteries of the figures and statements, and then will sink into a pleased state of indefinite admiration, while others may look for practical purposes. But for

our uses we must wait for applications to grow up. If we only knew how to suitably use them, no doubt the reports could be made to take the place of the changes of the moon and the "Veder Prognostications" of the almanacs, in indications for various domestic and other affairs and futurities.

The principal intention is to collect reports of the state of the weather throughout the portion of the continent over which storms come in reaching the Atlantic seaboard, for the benefit of commerce. Storms north of Florida come generally from a southwest course, so that their approach may be known and watched often one or two days in advance of their striking the seaboard, which may be of the greatest importance to shipping by the use of proper signals.

The War Department, under which the system is placed, and the officers in charge are pleased to extend every facility to the public in reaching the earliest results of the observations throughout the country; and they deserve a generous public appreciation.

The observations are taken "at the same moment of time" at all the stations. That is, they are not made at—say—6, p. m., at each station, but at the moment when it is 6, p. m., at Washington. The question of measuring time may seem very simple, and it may seem that, though the standards by which everything else is measured may vary from one country to another, there would be but one standard of time everywhere; the day of 24 hours, of 60 minutes, &c., about which no other particulars would be needed. But this is not all.—*Daily Gate City, July 27, 1871.*

DAVENPORT, *June 2, 1871.*

Gen. A. J. MYER,

Chief Signal Officer, U. S. Army,

Washington, D. C.

DEAR SIR: I herewith inclose you printed slip of pro-

ceedings of a meeting of our Board of Trade, in response to your circular of May 15th.

Allow me to say that the members feel warmly interested in the success of this important undertaking, and will afford all the aid in their power toward its advancement.

We are also under obligations to you for having stationed here as courteous and attentive a Signal Officer as Mr. Richmond has thus far proven to be.

Awaiting your further communications, I remain yours very truly,

(Signed:)

JAS. M. DALZELL,
Secretary Davenport Board of Trade.

KEOKUK, IOWA, *December 27, 1871.*

HON. W. W. BELKNAP,
Secretary of War,
Washington, D. C.

DEAR SIR: It would be a gratification to some of our citizens, if the weather or meteorological reports, at Keokuk, would give us some one or two points on the Atlantic coast, north of New York city, say Boston, or Portland, Me. As we now get it, New York is the only point north of Philadelphia.

I write you to ask for Boston report, if but one point can be added to the list. Of course there may be some good reason we know not of, for the omission.

Wishing you happy "New Year,"

I am yours truly,

CHAS. P. BIRGE.

INDIANA.

The Weather Business—Indianapolis Board of Trade.

At the regular meeting of the Board yesterday afternoon, the following preamble and resolution were offered by D. M. Berry, of the Meteorological Committee:

Whereas, The United States Signal Service Department, has placed in the rooms of this Exchange a Weather Chart, showing the various meteorological stations throughout the country, and are now daily exhibiting upon the same the vicissitudes of the weather in a conspicuous and intelligible manner for the benefit of the public; therefore,

Resolved, That the thanks of the Board of Trade of Indianapolis, be presented to the Signal Service Department, through Sergeant Wappenhaus, the accomplished officer in charge of the station in this city, for this valuable favor.

JOHN C. WRIGHT,
W. R. NOFSINGER,
E. T. COX,
S. T. BOWEN,
D. M. BERRY,
Committee.

Daily Sentinel, June 9, 1871.

KANSAS.

Storm Signals.

As the officer in charge of Signal Station at this place will very soon be in receipt of his flags and lanterns, we reprint the following article from the New York *Herald* describing the signals as seen in New York:

“The office of Storm Signals, No. 120 Broadway, went yesterday into operation. It is a branch office of the Signal Service Bureau at Washington, and its business is to announce the approach of storms. The day signal of approaching rough weather will be from the flag staff on the lofty summit of the building, a red flag with a black square in the centre, and the night signal a red lamp. With the aid of a glass these signals can be seen from a point in the north as far as Manhattanville, and on the south from Sandy Hook. From the wonderful accuracy of the weather ‘probabilities’ daily reported from the Signal Service Bureau, we are quite sure that these storm signals will be of very great service to those ‘who go down to the sea in ships,’ in warning them of coming storms, so as to enable the mariner to avoid them or trim ship to meet them. Indeed, we think that, on the land and water, with these storm signals in full operation from point to point, they will be the saving of millions of property which otherwise might be lost. And this is another of the incalculable advantages of modern civilization, resulting from the electric telegraph.”—*Leavenworth Bulletin*, October 28, 1871.

Weather Bulletins.

We recently mentioned the great usefulness and growing popularity of the system of weather bulletins and meteorological maps of the United States Signal Service Bureau; obtained by the aid of telegraphy from every part of the country. Leavenworth is one, a most important one, of the United States Signal stations, and has an able and accomplished observer. At this point, however, we receive the report of only a small portion of the United States Signal stations, and the daily weather maps reach us too late to interest us practically. What we desire and what we deserve, as the largest and most important military post in the West, is a full report from all the stations in the country. We are certain that Gen. Myer, who has charge of the bureau, knowing that the value of his inestimable work is appreciated in this locality, will be very ready to accord to our wishes. A petition to that effect is now being circulated, and we are confident that it will, when transmitted, contain the names of a large number of our most prominent and intelligent citizens.—*Leavenworth Commercial*, January 7, 1872.

LOUISIANA.

THE telegraph sent from Washington, near 12 P. M., Thursday, a summary of weather reports, adding this prediction :

“It is probable that partially cloudy and pleasant weather will be experienced on Friday from Missouri to Virginia and northward. It is probable that rain and high winds will prevail in the Gulf, west of Florida, during the night,”

Such rains and high winds began here early Friday morning. Twenty-four hours after the dispatch above quoted was sent, another prediction was sent, as follows:

“It is probable that the high winds in the Gulf will advance with rain to the coast of Louisiana.”

The prediction is now a disastrous reality, the wind and rain amounting to a storm. The southeasterly wind has been so violent as to blow the water of our lakes, already flooded by the Bonnet Carré crevasse, inland in the rear of the city, to the depth of six feet, causing enormous damage along the lake shore, and especially at Milneburg. The fulfillment of these prophetic warnings shows the growing value and importance of these barometrical reports.—*New Orleans Picayune*, June 4, 1871.

A Signal Station.

We have been shown a letter, addressed to the Board of Trade of our city, but there being no such organization, it was dropped by our Post Master in the box of Col. R. H. Lindsay. The letter is written by Brigadier General Albert J. Myer, Chief Signal Officer of the army, and conveys the gratifying intelligence that Shreveport has been designated as a station of observation and report. The cordial coöperation of the boards of trade, and other commercial associations is solicited.

The advantage resulting from meteorological observations, not only to commerce but to agriculture, have been fully demonstrated, and we take pleasure in commending to the favorable consideration of business men, the proposal on the part of Congress to establish a station in our city.

It is a reproach to our city that we have no chamber of commerce or board of trade, and steps should be taken by our merchants to form an organization of that character.

Every encouragement should be given to this proposal,

for it will bring our city prominently before the commercial world, and give a vast amount of valuable information respecting the atmospheric influences which affect mankind and also vegetation.

As the commercial influence of Shreveport has been recognized by the general government, in its selection as one of the signal stations, let us prove that we are worthy of such preference. To attain the high position to which we are entitled, we must secure a concentration of all public offices, and patronage for this section of country, and thus add to our wealth, population and influence in commercial circles.—*Shreveport, La., August, 1871.*

New Meteorological Bureau.

No doubt many of our citizens have been much interested in the weather reports published by direction of the War Department, which have appeared each morning of late in our telegraphic columns as coming from Washington. Some, no doubt, have scouted at the idea of any one foreshadowing the weather in all the principal sections of the country from any such place as Washington, D. C. But to the astonishment of many, accurate predictions have been made, so perfectly is the science of meteorology understood. The heavy gale and rain storm that swept over this city on Wednesday evening last, was foreshadowed at 4 P. M., on the afternoon of the same day, and telegraphed to all the principal cities in the country, as follows: "Probabilities.—A severe storm is indicated for to-night and to-morrow for the Gulf, high winds for Thursday on the lakes, and threatening weather on the South Atlantic, with fresh winds." The means by which this information is obtained, is through tri-daily reports made to the Signal Service Office of the War Department, which has now been in operation for nearly a year, under the charge and direction of Gen. Myer, assisted by an efficient

staff of officers, and a corps of seventy-five or eighty sergeant observers, a majority of whom were either promoted from the regular army or enlisted, because of their especial fitness for the duties required of them, which, in most places, especially at those where only one person was assigned for duty, was of the most arduous character, requiring frequently twenty hours attention out of twenty-four. But recently the force at nearly all stations has been doubled, by the assignment of a private soldier to duty as assistant observer.—*N. O. Picayune*, 1871.

NEW ORLEANS, *June 17*, 1871.

SIR: Your letter, addressed to the President, was laid before the Chamber of Commerce and a Committee appointed, to coöperate with the Chief Signal Officer, Division Telegrams and Reports for the benefit of Commerce.

As protection to person and property is the great end of government, Congress has wisely provided that the approach of storms may be announced and the danger cared for in advance.

As the work progresses, its design becomes more generally understood, and its importance more extensively appreciated.

The daily synopsis of the weather is eagerly noted in the telegraphic reports, and the probabilities, are watched with interest from their frequent and marked confirmation.

The difficulties of opening a station have been overcome, and a location obtained favorable to scientific accuracy.

We are glad that an agreement has again been made with the telegraph companies, and that the material is obtained from other stations to make tabulated reports, according to instructions of the Signal Officers. These reports together with the synopsis, are posted daily in bulletin form, in five of the most public attainable places: they are likewise furnished to the Cotton Exchange daily.

When established on the firm basis of experience, storm signals will be hoisted at the several stations, to give notice of approaching storms, &c., &c.

Improvements will doubtless be made in this as in all other scientific labors. It is hoped that self-registering instruments will soon take the place of those now used, so as to insure the greatest accuracy of measurement.

It would add much to the interest and value of these reports if they embraced the changes of temperature, &c., throughout the cotton districts of Georgia, Alabama, Mississippi, &c., &c.

We have much pleasure in testifying to the zeal and diligence of Observer Pullen, in all that relates to his duties here, and make no doubt that his services will be duly appreciated in the proper quarter.

We are, sir, very respectfully, your obedient servants,

(Signed,)

G. L. LAUGHLAND,

WM. C. BLACK,

of Committee.

TO ALBERT J. MYER,

Bvt. Brig. Gen. & Chief Signal Officer of the Army,
Washington, D. C.

OFFICE SHREVEPORT BOARD OF TRADE,

September 16, 1871.

General ALBERT J. MYER,

Chief Signal Officer, U. S. A.,

Washington, D. C.

DEAR SIR: I am instructed by a resolution adopted by the Board of Trade, on the 12th instant, to acknowledge the receipt of your communications, dated July 31st, and August 1st.

The Board of Trade fully appreciate the work you have undertaken, and believe that commerce and science will

be greatly aided thereby, and as an evidence of their appreciation of a station in this city, will give every aid and encouragement to the observing sergeant stationed here.

I herewith enclose you copy of resolutions adopted by the Board for your acceptance.

I have the honor to be your obedient servant,

R. H. LINDSAY,
First Vice President, Acting President pro tem.

—

SHREVEPORT, LA., *September* 14, 1871.

General ALBERT J. MYER,

Chief Signal Officer, U. S. A.,

Washington, D. C.

DEAR SIR: At a meeting of the members of the Shreveport Board of Trade, held on the 13th instant, the following preamble and resolutions were adopted unanimously:

Whereas, Under the authority of the Secretary of War, and in pursuance of an act of Congress, the Chief Signal Officer of the Army has taken steps to establish a system of meteorological stations, for the purpose of the observations and reports of storms, for the benefit of commerce and science, at Shreveport.

Whereas, In the opinion of this Board, the duties are of material importance to the commerce of the whole country; therefore, be it

Resolved, That a permanent committee of three be appointed by the chair, to confer with General Albert J. Myer, Chief Signal Officer, U. S. Army, from time to time, and to extend to him such assistance as may be in the power of this Board.

Resolved, That we elect General Albert J. Myer an honorary member of the Shreveport Board of Trade.

The chair appointed Messrs. Geo. Williamson, Chairman,
R. D. Sale and Geo. A. Pike, Committee.

A true copy of the minutes.

I remain your obedient servant,

THOMAS PHILLIPS,
Secretary pro tem.

MAINE.

Weather Forecasts.

The weather is more talked about, probably, than any other topic. It is seldom forgotten, even in the briefest interviews, and the forecasts, put in hap-hazard, in almanacs, are not by any means wholly neglected. People like to chat and prophesy about the weather, mark its vicissitudes, and growl about them when they don't come to suit. But with all the attention given to the subject generally, only a few classes really appreciate its importance in a business point of view, among whom are those who go to sea in ships, and those who make hay and need sunshine for the purpose.

But could it be announced with tolerable accuracy each morning what is to be the general character of the weather the ensuing twenty-four hours, who would not regard it as a great desideratum, both for convenience and in a business point of view? There can be no question that it would be such; and it is to supply this, that the Signal Corps of the War Department are now reporting, at stated hours, the condition of the weather in different parts of the country, with forecasts of what it will be on the morrow. The synopsis of the weather thus furnished, which we publish every morning, is particularly important in the interests of commerce,

and it is for that purpose chiefly that it is provided. The forecasts, based upon the reports from the different stations, have unfortunately not been received in season to publish, except a part of the time. For the general reader, these are the most important, and we trust measures will be taken to furnish them in season for publication, which must be as early as half-past three in the morning. If received later than that we cannot use it, and we trust the Chief of this Service will see that it is furnished in time.

The weather reports are simply an experiment at present; but we cannot doubt that they will be continued and become a permanent institution. With reference simply to the safety of life and property on the water, the advantages will far outweigh the cost; but this will be only a small part of their value. Science will be promoted by them, and the public instructed in the significance and laws of atmospheric changes. We trust that on no account will they be suffered to be discontinued. Professor T. B. Maury, the distinguished meteorologist, has furnished to *Scribner's Monthly*, two interesting articles upon the science of forecasting storms by the aid of weather telegrams, such as our Government has recently commenced; and from his second article we take the following:

“In the northern parts of the United States, according to Professor Espy, the wind in great storms generally sets in from the north of east, and terminates from the north of west; while in the southern parts it generally sets in from the south of east, and terminates from the south of west. With these facts before him, the observer is ready to understand his instruments, and no meteorologist should depend on his instruments alone. Great changes of weather or storms are usually shown by falls of barometer exceeding half an inch, and by differences of temperature exceeding fifteen degrees. A tenth of an inch in an hour is a fall presaging a heavy storm or rain. The more rapidly such changes occur, the more probable a violent atmospheric commotion. To understand the fluctuation of the barometer, we have

only to compare it with its normal height for the time, and so with the thermometer. This may be done generally by examining an iso-barometric chart, which gives you the lines along which the barometer ranges the same number of inches in clear weather, and the isothermal chart, showing the line of equal temperature. Barometers show the beatings—the pulsations of the atmosphere—and their diagrams express to practised observers, to use the words of Admiral Fitzroy, ‘what the ‘indicatorcard’ of a steam cylinder shows to a skillful engineer.’ ”

M. Marie Davy, Chief of the Meteorological Division in the Imperial Observatory, Paris, who has for some years made this a special study, states that the “perturbations of the magnetic needle are inseparably joined with one or more of the three following phenomena: 1. General disturbances of the telegraphic lines—due to wide spread auroras, which mark general movements of the atmosphere in high latitudes and over the Atlantic. 2. Disturbing currents of a more local character, occurring over the telegraph lines some time before the storm appears to which they owe their origin, thus strengthening the distance and time at which the approach of the storm may be perceived. 3. Disturbing currents, still more restricted, accompanying the electric changes when the storm itself is passing.” Blood red streamers of aurora crossing the sky, and meteoric and electrical exhibitions preceded the gale in which the Royal Charter went down. If we could have more magnetic and meteorological observatories, as Buchan suggests, the magnetic and electric states of the atmosphere and auroras might be made our most valuable prognostics of storms.

It has also been discovered that the presence of large quantities of ozone (which can easily be ascertained by ozone test-papers) foreshadows an impending atmospheric storm.

These unbidden monitions, together with many others—as the sun setting red, a remarkably red color of the clouds; the sign almost infallible, at Mauritius, of the brick-dust haze in the horizon; a thick, muddy atmosphere, but extra-

ordinarily clear on mountains; frequent shiftings of breezes from all points, thick fog flying fast to the south, a bright halo round the moon, stars very brilliant and unusually twinkling at low altitudes, noises in caverns and wells like a storm, moisture on walls and pavements, sea-birds coming to land, water-fowl flying about; the swell of ocean rolling in, though the hurricane may be 600 miles distant; turtles floating in the calm, apparently in a state of stupor; the sea peculiarly clear at great depths, tides irregular; branches of trees not bent forward as by a stream, but constantly whirled about; water rising in the wells and ponds; disturbances of currents on the telegraphic wires—are some of the oft observed presages of the “thing of evil.”—*Eastern Argus*, March 3, 1871.

THE U. S. Signal Department has placed in the Merchants' Exchange a weather chart showing the meteorological stations recently established throughout the country. The telegraphic report of observations taken synchronously at these stations at 8 A. M., (Portland time,) will be placed upon this map as soon as received; the weather at each station being indicated by appropriate symbols and figures readily understood, and by which the location and progress of storms can be observed at a glance.

Masters of vessels, especially, are invited to avail themselves of the facilities offered at the Merchants' Exchange and at the Signal Office for obtaining information that cannot fail to be of great interest and benefit to navigation. Free admission to the room of the Merchants' Exchange is allowed to all ship masters in active service.

C. H. FARLEY,
M. N. RICH,
JAS. S. BEDLOW,

Meteorological Committee Bd. of Trade.

Eastern Argus, Portland, May 31, 1871.

MARYLAND.

Weather Prognostics.

A little hand-book of meteorology, published by the United States Signal Service Bureau, contains more useful and practicable information on the subject of which it treats than any other work of the kind that we have ever seen. No technical terms are used, and the elements of the science are brought down to the comprehension of the unlearned. The object of this publication is to instruct people of average intelligence in the use of the weather report tables, daily published in the *American*, and to teach them how to make out weather prognostics for themselves from the data furnished by the reports. It may be here remarked, that the prognostics furnished by the Bureau are sometimes at fault, but it is because new conditions enter into the problem, of which the Department, from the nature of the case, can have no notice. If it were possible to have stations for observation all over the continent, as well as on the north Atlantic ocean and the Gulf of Mexico, then the weather prophets might make out their bulletins with almost absolute certainty that their predictions would be fulfilled. Even with the present limited facilities for observation, their "prognostics" are greatly relied on, and they generally prove to be correct.

The barometer is of all others the instrument most relied on in meteorological observations. Nearly all the changes in the weather are due to the inequality in the pressure of the atmosphere at different points, and the constant struggle, as it were, that is going on in the ærial regions to maintain an equilibrium. A brief outline may be given of the man-

ner in which meteorological changes are predicted. Everybody knows that the height of the mercury in the tube of the barometer indicates the pressure of the atmosphere at that particular point. The pressure varies according to the temperature, moisture, depth and motion of the atmosphere. The average height of the barometer on the Atlantic coast is thirty inches; that is, the pressure of the atmosphere sustains a column of mercury thirty inches high. On the Western plains it rises to 30.2 inches, and diminishes as we go to the North Pole. Take the report for any given day, and trace a line on the map, from point to point, at which the barometer stands at less than thirty inches. These lines will be found to be all on the same side of the average line of thirty inches, and to be approximately parallel to each other. Then another series of lines may be traced between the points at which the pressure is more than thirty inches. In this way a belt of country is enclosed between the two series of lines, which is bounded on one side by the limit of low pressure, and on the other by the limit of high pressure. The whole surface of the continent appears to be covered with alternate belts of high and low pressure. But sometimes the area of low pressure is comparatively small, and, instead of being a belt, is a square, enclosed on all sides by the limits of high pressure. When this occurs, that particular region may well apprehend a tornado.

In accordance with the laws of mechanics, the air must always be pushing from the regions of higher to those of lower pressure, and this movement we call the wind. In any area of high pressure the winds blow away from the centre, and are deflected towards the right as they move forward. In any area of low pressure the winds blow towards the centre. Of course there are conditions that may somewhat modify the general law, such as the forces of inertia and friction, and the presence of mountains or hills that obstruct the current of the winds. In addition to the winds occasioned by the causes mentioned, there are great currents spreading over continents, and encircling the earth, which

are created by the rotation of the earth. But it is the local winds that are indicated in the Bureau reports. When there are no well defined central areas towards which, or from which the winds proceed, they still obey the general law, and blow from the regions of high pressure to the regions of low pressure. When the lines of high and low pressure approach each other there will be heavy gales over the regions between, which die away as the equilibrium is restored, and the lines recede from each other.

The temperature, as indicated by the thermometer, enters largely into the weather problem, but no special mention of it need be made in this synopsis. There are areas of rising and falling temperature, and it is by closely observing the variations in these areas that the coming of storms is foretold.

The moisture in the air is another important element in the calculations. Watery vapor dissolves in air very much as salt dissolves in water, and as the salt is deposited in crystals whenever the water is fully saturated, so it is with the atmospheric vapor. One cubic foot of air, having a temperature of fifty degrees, and under a uniform pressure of thirty inches, will hold 4.28 grains of water when fully saturated. If, then, the temperature, or the pressure of the air is lowered, there must result a deposition of a portion of the water, either in the form of fog, dew, rain, frost or snow. On the other hand, if the temperature or the pressure be increased, the air becomes capable of holding a larger quantity of vapor, and ceases to be fully saturated.

By carefully noting all these conditions, the weather prophet can tell with considerable certainty when it is going to rain, and when the winds will lift away the clouds.

By a series of observations, meteorologists have discovered that storms are controlled by certain laws, and that the areas of stormy weather and clear weather, alternate with each other with remarkable regularity. The lines of high and low pressure, and the areas of high and low temperature, are in continual motion, generally to the eastward, except for

the regions south of thirty degrees of latitude, where the movement is westward in summer.—*Baltimore American*, August 7, 1871.

UNTIL RECENTLY the laws that govern the course of storms have been, at best, but imperfectly understood, and, even at this time, there is yet a good deal to learn respecting them. Much, however, has been accomplished within the last thirty years by American and English investigators, and we are now about to realize important practical results from studies that, at first, seemed likely to bear but little useful fruit. The perplexities of meteorologists grew out of the extent of the field of observation, and the utter impossibility of drawing, from indefinitely multiplied records, any system of rules that would be uniformly applicable. When, therefore, Admiral Fitzroy abandoned the idea of simply telegraphing the state of the weather from day to day, and undertook to prognosticate, from each day's meteorological observations, the approach of storms, at what time they would probably reach the British coast, and what course they might be expected to take; and when he further put in practice, at the most prominent points along the British coast, a simple system of storm-warning signals, the immense importance of this new step in meteorology soon began to manifest itself. At the outset, it was quite natural that some difficulty should be encountered, and that the storm-warnings should sometimes turn out wrong. Deflections in the course of the storm would occasionally occur, and there were other causes, affecting the correctness of the deductions drawn from the meteorological phenomena, which were not then as carefully studied as they have been since. The improvement in the trustworthiness of the forecasts of the weather proceeded, however, quite rapidly. Of the storm-warnings given on the British coast in 1865—the first year they were

introduced—only fifty per cent. proved to be right. The second year seventy-five per cent. were right; whilst “out of one hundred warnings sent to the north coast of France, during the winter of 1864–5, seventy-one were realized; and during the second winter seventy-six. Out of one hundred storms that occurred, eighty-nine were signalled during the first winter, and ninety-four during the second winter. This result,” says Buchan, as quoted by Maury, “is remarkable, as showing that of the storms which occurred in the north of France during these two winters, warning of the approach of eleven out of twelve was sent.” Shipowners and marine officers on the British coast have since testified to the great utility and importance of these storm-warnings, and the opinion is expressed that they have already “been the means of saving lives and property to an immense extent.”

The organization of a special branch of the United States Signal Service, for obtaining weather telegrams and despatching storm-warnings, promises to be of even greater utility than the similar service abroad. Although only just at the beginning of its labors, the extensive arrangements which have been made by the Chief Signal Officer for obtaining meteorological reports from every part of the country are worthy of all praise. The meteorological table, which has been published daily of late, in the chief cities of the Union, indicates how thoroughly the new system has been digested and the valuable facts which it is capable of recording. But this daily record of observations, important as it is, not only to those “who go down to the sea in ships,” but also to that large class of the population engaged in agricultural pursuits, had one serious defect—it was too abstruse to be properly comprehended by any but scientific men. There are very few persons in the country who are acquainted with the science of meteorology, and fewer still who are sufficiently conversant with the subject to forecast the track of any given storm, because it is only of late years that the general course of great storms has been conclusively ascertained. To obviate this difficulty, and as a means of

making this branch of the Signal Service not only eminently useful, but in the highest degree popular, a change has been made within the past day or two in the form of the reports.

This change consists in announcing daily the rise and fall of the barometer and thermometer at various points widely separated from each other, and by a careful digest of the meteorological observations which have been made throughout the day, forecasting the probable character of the weather, and the approach or cessation of storms. This is exactly what was wanted. By glancing each morning at the weather report, as published in the daily journals, the mariner finds it stated, in language that he cannot misunderstand, at what point a storm may be raging, or when and where a storm may be expected, or what the prospects may be of fair weather. The farmer, also, who is so situated as to obtain a city newspaper within a few hours after it has been issued, is equally forewarned, and during the season of active field operations will thus be enabled to guard against the worst effects of an approaching storm. For those farmers residing in the remoter interior districts, it is in contemplation to adopt a system of storm-warning signals, by means of the firing of cannon. But whether this latter suggestion is carried out or not, it is already evident that through the means of this new branch of the Government Signal Service and a well arranged system of weather telegrams and storm warnings, much property may be protected against injury or still more serious devastation, many shipwrecks averted, and many valuable lives saved.—*Baltimore Gazette*, January 27, 1871.

The Weather Reports.

Of the reports furnished by the Government Signal Service, sixty-nine per cent. of the probabilities have been verified by the result, and twenty-one per cent. in addition

partially verified. The haste required to get these reports promptly before the public has made the percentage of verification less than it would have been with more leisure. Reports taken at all stations at 11.35 P. M., are telegraphed to Washington, collated, and the deductions made are furnished the Press at 1 A. M.

To extend the system of synchronous reports, an observer thoroughly instructed and equipped was sent with Captain Hall, commanding the North Polar Expedition. To get observations of the higher ærial currents, a station has been established and maintained on the summit of Mount Washington, New Hampshire. Reports are desired from Pembina, Sitka and the Sandwich Islands. It is proposed to extend the synchronal system by seeking the assistance of such ship captains as are willing to make observations and record them upon forms furnished by the Signal Office. An international system of observations is suggested. Such system is at once needed, in order to obtain reports from the West Indies, the Windward Islands, and the coast of South America.—*Baltimore American*, November 21, 1871.

To Masters of Vessels.

The U. S. Signal Department has placed in the Merchants' Exchange a weather chart, showing the meteorological stations recently established throughout the country. The telegraphic report of observations taken synchronously at these stations at 7.37, A. M., (Baltimore time,) will be placed upon this map as soon as received; the weather at each station being indicated by appropriate symbols and figures readily understood, and by which the location and progress of storms can be observed at a glance.

Masters of vessels, especially, are invited to avail themselves of the facilities offered at the Merchants' Exchange and at the Signal Office, for obtaining information that

cannot fail to be of great interest and benefit to navigation. Free admission to the rooms of the Merchants' Exchange is allowed to all shipmasters in active service.

H. L. WHITRIDGE,
ROBT. R. KIRKLAND,
B. M. HODGES, JR.,
WM. H. BRUNE,
J. HALL PLEASANTS,

Meteorological Committee, Bd. of Trade.

Baltimore Price Current and Weekly Journal of Commerce, June 10, 1871.

The Change in the Weather.

The "clerk of the weather," that is the Signal Service observer, in his abstract of the midnight report Wednesday night, when it was damp and mild and cloudy, delivered the following judgment; "probable change to cold weather, and snow within thirty-six hours; if not, then clear weather will set in from northwest." Before eleven o'clock last night the latter clause of the prediction was fully realized, clear weather having set in from the northwest, with a change to cold.—*Baltimore Sun*, February 3, 1871.

MASSACHUSETTS.

THE United States Signal Service is certainly doing, according to the dictionary definition of the descriptive epithet, eminent, remarkable, extraordinary, distinguished service. Established without any flourish, it has been quietly at its work, winning attention by its usefulness, until now it excites daily remark as it daily makes trustworthy reports and gives "probabilities" regarded as counsels not to be neglected. Owing to the instantaneous help of the telegraph, whereby observations can be made over a vast territory and data collected from many points growing constantly more numerous, there is a sure promise that we are to have a science of the weather which will interpret phenomena so long considered beyond the reach of human ken. The "Bureau," in its ever augmenting facilities, is rapidly becoming ubiquitous; and it seems clear that there will be no limits to the enlargement of the operations it has inaugurated, until the entire globe is compassed by its inquiring and centralizing agencies, and that the whole heavens will be watched by them.

People are so used to wonders that they hardly marvel as they should at this fact and all it predicts of the future, though almost hourly taking advantage of the knowledge communicated by the new Department for the benefit of commerce, and for the benefit of many other kinds of business as well. The questions now earnestly asked by such as must take the weather into account in their various operations, as to the intelligence from Washington, and the eagerness with which the reports are read in the papers every morning and evening, show how generally and quickly the community is recognizing the peculiar conquest over time and space that seeks

to put an end to troublesome and often dangerous uncertainties, and to furnish, in so quiet and modest a way, intimations that are far removed from all guess-work and gaining constantly in exactness. The warning given of the recent great gale all along the coast, several hours before it began, is almost enough of itself to justify the establishment of the "Bureau," showing as it does, in one striking instance, its efficiency.

The addition of the "cautionary signals" has given to this institution of the War Department, fresh importance that cannot fail of being acknowledged in every seaport where they are displayed. The pamphlet explaining these, and adding instructions as to other matters connected with meteorological investigations and the use of the barometer and thermometer, is one that will be read with interest, and is to be commended for the simplicity and clearness of its suggestions.—*Evening Transcript, Boston, Nov. 21, 1871.*

Storm Signals.

TO THE EDITORS OF THE BOSTON DAILY ADVERTISER :

In order to make storm signals useful to vessels passing through our sounds and along our coasts within sight of prominent points, we want something more than mere newspaper records. It is all very well for the merchant who has a ship about to go to sea, or the captain who commands her, to read the morning paper and find out how the weather is at Chicago or St. Louis, Milwaukee or at Washington Observatory. The *seamen* on the coast cannot very well put in at Holmes's Hole, Hyannis or Newport to read the newspapers (unless, indeed, they have wives or sweethearts at those ports). They would like to know something about coming storms. What we would suggest is that there be placed at prominent points, such as Little Gull

Light, Cuttyhunk, Nabska Light, West Chop, or Holmes's Hole, a signal station for the purpose of warning vessels as to approaching storms.

If it could be done without too much expense, it would be well to have telegraphic submerged communication with light ships where large numbers of vessels pass, such as Cross Rip or Shovelful, in the route over the shoals between the Vineyard Sound and Cape Cod. But this might be too expensive, and could not very easily be done on account of the swinging of the ship. Still it could be done by watching the opportunity for shifting the wire at the turn of the tide.

The object in having information thus communicated is in order that vessels may speak with the light ship in cases where they happen to be without means of comprehending mere signals.—*Boston Daily Advertiser*, February 4, 1871.

THE general accuracy of the weather predictions telegraphed from Washington, has been often remarked, and there is reason to expect that they will gradually grow more and more trustworthy, as the observers gain greater experience. For the convenience of those who may wish to obtain early information on this subject, the "probabilities" for this section will hereafter be bulletined in front of *The Republican* office, semi-daily, as soon as received. The predictions, as most people know, are based on observations made by meteorological observers in different quarters of the country, several times a day, and despatches are sent from Washington to the press, under date of 10.30 A. M., and 7.30 P. M., which are received in Springfield as soon as 2.30 and 11.30 P. M., at which hours they will be bulletined. Should the Service be hastened, as it certainly ought to be, the public will have the advantage of the earlier transmission, and the despatches will be in a corresponding degree, more valuable.—*The Springfield Republican*, July 13, 1871.

NATIONAL BOARD OF TRADE,
BOSTON, *January 2, 1872.*

Brig. Gen. ALBERT J. MYER,
Washington, D. C.

SIR: I beg to annex copy of a resolution adopted at the recent meeting of this Board, in the city of St. Louis, and I shall be glad if your Bureau shall decide to establish a Weather Station at Quincy, Illinois, in accordance with the expressed wish of the Board.

I am your obedient servant,

HAMILTON A. HILL,
Secretary and Treasurer.

Resolved, That the Executive Council be instructed to ask the War Department to cause a Signal Station to be erected at Quincy, the second city in the State of Illinois, in order that reports of the weather may be regularly made from that port, for the benefit of the country generally.

HARVARD COLLEGE,
CAMBRIDGE, MASS., *August 16, 1871.*

SIR: I beg to acknowledge, with many thanks, the receipt of a copy of "Suggestions, &c.," and of one weather map of the date of August 7, and to express, at the same time, my high appreciation of the excellent work done by the "Division of Telegrams and Reports for the benefit of Commerce," and my hope that you will have every facility and encouragement to extend and perfect this important Department of the public service.

Yours truly,

CHARLES W. ELIOT,
President.

Gen. ALBERT J. MYER,
Chief Signal Officer, U. S. A.

EXTRACT FROM ANNUAL REPORT OF BOSTON BOARD OF
TRADE, 1871.

* * * * *

It appears to us of the highest importance that Boards of Trade, Commercial Associations, and Insurance Companies through the country, should cordially coöperate with the Government in its intelligent and liberal measures. Your Committee cannot too much commend the thoughtfulness of Congress in the establishment of the Weather Signal Service, called the "Bureau of Telegrams and Reports for the benefit of Commerce," and the fidelity of the Chief Signal Officer and his able assistants, in carrying out every provision for the success of the work. The Committee, having been in frequent communication with the observer stationed at this post, takes pleasure in testifying to his conscientious performance of the arduous duties of his office by night and by day. Each succeeding year will undoubtedly suggest new improvements in the methods of taking observations, and each annual report of your Committee will record new victories won in the field of this new but most important and valuable science of meteorology.

THOMAS GARFIELD,
ROBT. S. PERKINS,
M. D. ROSS,
JOHN CUMMINS,
EUGENE H. SAMPSON.

Boston, January 2, 1871.

EXTRACT FROM ANNUAL REPORT OF BOSTON BOARD OF
TRADE, 1872.

The eighteenth annual meeting of the Board of Trade was held yesterday afternoon, Vice-President Joseph S. Ropes in the chair.

* * * * *

Thomas Gaffield, chairman of the committee appointed to

examine and report on the storm signal office, presented a very interesting paper on the workings of the system, the substance of which is here subjoined :

Referring to our last annual report for an account of the establishment of the "Division of Telegrams and Reports for the benefit of Commerce," your committee takes pleasure in recording at this time the great progress which has been accomplished in this most interesting and important branch of the national service.

The signal office in Boston was removed in January to a more convenient location, at No. 103 Court street, near the corner of Hanover street. From the top of this elevated building the storm signals, flying from a flag-staff, can be plainly observed by all vessels coming into the harbor. In order that they may be known equally well to those lying at our wharves, it has been suggested by several gentlemen connected with navigation and marine insurance, that these signals should be repeated at the old State House, the Custom House, at some elevated point in South or East Boston, or from one of the forts in the harbor. Some of our experienced sea captains have also suggested the great importance of a station on the coast of Cape Cod.

Your Committee intend to give these matters due consideration, and they have no doubt that upon proper representation of the subject, the Government will do all in its power to extend the usefulness of the service by the establishment of new stations and the repetition of the storm signals at Government military posts, or at other proper places along our coast. The faithful observer sergeant, Mr. Daboll, whose ill health occasioned his absence on leave in the summer, and his subsequent removal to the station at Jacksonville, Florida, has been succeeded by observer sergeant Henry E. Cole, whose industry, skill and accuracy in the preparation of his daily reports have merited the warm commendations of your Committee.

Observations are now made of the barometer, thermometer, hygrometer, the direction and force of the wind, the

condition of the clouds and sky at 7.35 A. M., 4.35 P. M., and 11.35 P. M., true time, and transmitted by telegraph to Washington. At 7 A. M., 2 P. M., and 9 P. M., local time, similar observations are daily made for record in the local offices. Once a week a copy of these records is sent by mail to Washington. The stations are now supplied with self-registering anemometers, whose movements by an electrical attachment are recorded in the office of the observer.

At the beginning of the year the Government contemplated the establishment of forty-five observing stations, reports from sixteen of which were daily received at Boston. Sixty-two have now been established, and reports from fifty-seven are daily received here. Reports are also transmitted from Toronto and Montreal, in Canada. Meteorological maps are prepared daily after the receipt of the morning reports, on which are recorded, at each station, the height of the barometer and thermometer, the force and direction of the wind and the state of the weather, and copies of these, with the weather bulletins, are placed at the Merchants' Reading Room, Public Library, Union Telegraph office, Revere and American houses, and in a few other prominent places.

At Washington, at the office of Gen. Myer, the Chief Signal Officer of the Army, so perfect are the arrangements, and so skilled are all the observers, that in an incredible short time after the reception of the reports from all portions of the country, the necessary deductions are made, based upon the laws governing the winds and storms; and prognostications of the weather for the succeeding twenty-four hours, are sent throughout the land. These are daily published in the morning and evening journals, with the other details of the meteorological reports from the stations, and have excited the surprise and admiration of our merchants and navigators, by their accuracy and reliability. Following these prognostications, whenever a wind, with velocity exceeding twenty-five miles per hour is expected, cautionary signals are ordered to be displayed at the threatened points, consisting

of a red flag, with black centre by day, and a lantern with red light by night. A notable instance of the value of these signals occurred on November 14.

The cautionary flag was displayed at 3.15 P. M., and all vessels regarded the caution, and remained safely in port, except the *Star of the East*, whose captain ventured out and was obliged to put back, the predicted gale coming on with great fury at 12.10 A. M., of the next day. We need not add that one captain certainly will in future bear testimony to the value of the storm signals, and will respect them implicitly. The Government is doing everything in its power for the improvement of the signal service. All the observers are taught by competent instructors at Fort Whipple, and undergo careful examination before being placed on duty. A new cipher has been adopted for telegraphic communications by which ten words can give more information than was formerly transmitted by twenty. The daily journals and our citizens in all the relations of active life are beginning to appreciate and to express their appreciation of the importance of the signal-service.

Capt. Nash, commander of the underwriters' relief steamboat, told the chairman of your committee that he would never leave port with a vessel when the signal-officer predicted a coming dangerous storm, or gale of wind. On one occasion, when the appearance of the sky, to a superficial observer, might seem quite threatening, Capt. Nash, desiring to take a steamer out a port, applied to the signal office at Portland and was assured that for twenty-four hours he would experience but light breezes and a flurry of snow during the latter part of the time. Perfectly confiding in the signal officer, he immediately left the port, proceeded for seventeen hours in almost perfect calm, then experienced the predicted flurry of snow, and reached his destination in safety.

The officer at the Boston station, Henry E. Cole, is a most skillful and intelligent observer, and full of interest and enthusiasm in his work. He will gladly meet any member

of the board at his office, and explain to them his charts and maps, and the workings of his various interesting instruments to measure the height, the weight and moisture of the air, and to ascertain the force and direction of the winds. It is to be hoped that all our mercantile and scientific associations will continue to take an interest in and coöperate with the observers in their arduous but important work.

In conclusion, the committee would reiterate their cheerful and grateful testimony to the skill, fidelity and industry with which the Chief Signal Officer of the Army, General Myer, has managed this department of the national service, and to the continued faithful and intelligent performance of duty by the able assistants whom he has called around him at Washington, and stationed at the different posts of observation throughout the land.

THOMAS GAFFIELD,
JOHN CUMMINGS,
M. D. ROSS,
EUGENE H. SAMPSON,
ROBERT S. PERKINS.

WOODS' HOLE, MASSACHUSETTS,
September 29th, 1871.

DEAR SIR: The telegraphic despatches relating to the weather, which you were so kind as to order sent me here, have been regularly received, and have been of the utmost assistance to me in my explorations—enabling me to determine with almost unerring certainty upon the feasibility and propriety of starting out upon any projected expedition. As most of my time has been spent on the water, the benefit of this information has been proportionately great. The number of instances in which the anticipation failed to be verified by the experiences of the day have been extremely few; and, as the inhabitants of the village are nearly all sea-faring

men or fishermen, they have been in the habit of applying to me for indications of the weather, and guided their own movements by them.

I write now, to-day, that, as I expect to leave this place in a few days, having finished my summer's work, I shall not trouble you to continue the transmission either of the weather despatch or the weather map, both of which have been received with much punctuality. Hoping to have the opportunity of expressing in person to you my sense of obligation in this matter, I remain, very respectfully, yours,

(Signed,)

SPENCER F. BAIRD,

U. S. Commissioner of Fish and Fisheries.

Gen. A. J. MYER,

Chief Signal Officer, U. S. A.,

Washington, D. C.

MICHIGAN.

The Weather Station on Lake Huron.

A few days since the Board of Trade in this City, by vote, requested the War Department to establish a signal station at Port Hope. There are those, however, who think Au Sauble the better point of the two for a station of this kind. The former point is only about sixty miles distant from St. Clair river, and it is pretty generally conceded that the state of the weather does not vary at that point materially from that of Detroit, and in most instances, as might have been seen within a short time past, it is uniformly the same.

The danger to the shipping is almost exclusively centered from the Straits to Point Au Barque. From that point to the river there is more or less protection afforded, and hence it would seem the necessity of locating the above signal station at Au Sauble, instead of Port Hope, as some have suggested. It is the point above all others.—*Detroit, July 21, 1871.*

Hit It Again.

Monday night the red light was hoisted at the government signal station to indicate the coming of a storm, and sure enough the storm came last evening as predicted, the snow shaking down in a lively way. The signal men have hardly ever been wrong in their reckoning, and the public are fast losing faith in the "oldest inhabitant" and other self-styled weather-prophets.—*Detroit Free Press, November 29, 1871.*

BOARD OF TRADE ROOMS,

DETROIT, MICH., *Feb. 17, 1871.*

It is hereby certified, that, at a meeting of the Board of Trade of the City of Detroit, held on the 6th of January 1871, the following preamble and resolution were unanimously adopted :

Whereas, This Board is deeply impressed with the importance and value to commerce of the system of signals recently inaugurated through the beneficence of our Government, as well as of the desirability of perfecting the system, so far as changes can be made directly calculated to subserve the great and rapidly developing interest sought to be promoted; and

Whereas, No stations have been located in the Lake region between Milwaukee and Detroit, a circuit of six hundred miles in extent, embracing the main track of commerce of the lakes, the navigation of which is attended with more than ordinary peril; therefore,

Resolved, That Congress is hereby respectfully requested to appropriate a sufficient sum to secure the establishment of signal stations at Escanaba and Huron City.

A true copy,

(Signed,)

RAY. HADDOCK.

BOARD OF TRADE ROOMS,

DETROIT, MICH., *April 6, 1871.*

DEAR SIR: We have the honor to inform you that, at a special meeting of the Board held this day, the following preamble and resolutions were unanimously adopted,

Whereas, Experience has demonstrated the inestimable importance and value to the marine interest of the weather reports furnished under the auspices of the War Department; be it

Resolved, That the Chief Signal Officer is hereby respectfully requested to cause said reports to be furnished this point daily from the west, northwest, southwest and lake stations.

Respectfully your obedient servant,

(Signed,)

C. M. GARRISON,

President.

(Signed,)

R. HADDOCK,

Secretary.

MINNESOTA.

ST. PAUL, MINN., *June 27, 1871.*

To the Chief Signal Officer of the Army.

DEAR SIR: I would most respectfully ask to have a copy of the monthly meteorological chart for our academy of natural sciences. The sergeant will gladly furnish it, with your permission; and here let me say, the sergeant is under my daily observation, and it gives me pleasure to commend his politeness and efficiency on all occasions in making and furnishing weather bulletins, &c., &c. The only delay is caused by non-arrival of telegrams.

Yours, very respectfully,

R. O. SWEENEY,

President Academy Natural Sciences,
and Chairman Meteorological Committee, Chamber of Commerce.

MISSOURI.

Weather Telegrams and Storm Forecasts.

It has been hitherto thought that only persons engaged in maritime pursuits were specially interested in the meteorology of storms. But the importunities of science are forcing all classes to realize that not only each branch of industry, but the welfare and security of every person, whether on the

sea or on land, more or less depends upon a general knowledge of the law of storms, and upon a timely warning, through some organized agency, of their approach.

To this end, various governments are taking the matter in hand; and by the establishment, within their own jurisdiction, of bureaus charged with this special subject and its collateral investigations, are endeavoring, not only to educate the people to a just comprehension of its importance, but by enlisting their interest and coöperation, to give the greatest usefulness to efforts in this direction. Congress, at its last session, authorized, under the direction of the War Department, the establishment of a Meteorological Bureau, and it has been placed in charge of Gen. Myer, the Chief Signal Officer of the Army. Observers are now stationed at all the principal cities along our seaboard, as well as on the lakes, and in the interior, and at those military posts of the new States and Territories, that are reached by telegraph, whose duty it is to give timely notice of the approach of danger. These being in constant communication with the central office, their reports are scanned by experts, who can at once, and with remarkable precision, not only trace out the path that will be pursued by a storm prevailing at any point, but even foretell its approach to such point, and thus forewarn the shipping of the seaboard and lakes, and every part of the interior, in order that railroads, steamboats, farmers, manufacturers, builders, and other mechanics, as well as travelers, invalids, and all who may be in positions of exposure, may have ample time to secure themselves or their property against the too frequently disastrous effects of resistless winds, rains and freshets, or snows and cold.

It will no doubt surprise many to learn that the laws governing storms are as fixed as those controlling any of the other phenomena of nature, and are now so well known, that by the establishment of a proper system of observations, the beneficial results may be daily felt in some part or another of our country.

Independently of its utility, the whole subject—like all the

wonders of nature—is so interesting that it well repays investigation. With the view of directing the minds of our readers into the proper channel for its elucidation, we would call their attention to an article—the first of a series—in Scribner's Magazine, for February, from the pen of Prof. T. B. Maury, of New York, whose faculty for presenting scientific and abstruse subjects in simple and attractive language is seldom surpassed.—*Missouri Democrat*, January 19, 1871.

The Telegraph and the Storm.

The statement of Mr. Singleton, the weather observer at this point, that he was in constant receipt of applications from parties in the country and elsewhere, requesting him to send them daily bulletins of the weather forecasts, and the letters that have just passed between the committee of our Merchants' Exchange and the Chief Signal Officer, Gen. Myer, in regard to the connection of reports of the stages of the rivers at various leading points with these daily bulletins, show how general is becoming the interest of all classes of our people in the operations of the Meteorological Bureau, which, in its inception, less than two years ago, was scouted and ridiculed by most of the journals that took any part in the discussion of its organization, and especially by those of the seaboard and lake towns. Yet the work of this admirable institution is as yet in its incipency, so far as its possibilities in the interests of commerce, agriculture, and science are concerned. It embraces a comparatively unoccupied field in this country, and one which from its extent—reaching from the Atlantic to the Pacific, and from the Gulf of Mexico to the Lakes—will afford the grandest theatre for the study of meteorological phenomena that, in the present condition of civilization, can be found anywhere on the earth's surface. We are glad to see that Gen. Myer and his staff of observers and workers seem fully alive to the import-

ance of the duties of the situation. There is probably no single record of intelligence in the morning papers that is so universally consulted by our readers as the "weather reports and forecasts," which are telegraphed from the Bureau at Washington to every part of the country, and in order to have an intelligent knowledge of the process by which the data is obtained and rendered available, as well as of the general laws governing storms, our people would find it an interesting and instructive study for both themselves and their children, to give more than ordinary attention to the admirable articles that appear from time to time in our monthly journals upon this subject.

Scribner for February and March, and Harpers' Monthly for August, contain articles by Prof. T. B. Maury that are beautifully written, and are full of instruction upon this interesting topic. The fearful storms which frequently sweep over our country and carry such devastation of material objects in their paths, become appalling in their destruction of human life when passing over the densely populated regions of India and China. Prof. Maury speaks of one that occurred at Calcutta in 1864, that "destroyed in a single day 45,000 lives," and we know of another that swept over the southern part of China in 1849, in which it is estimated that 100,000 people perished in one night! Yet the vast majority of these people would have been saved, had there been the same means in those countries for giving timely warnings of the approach of the storms that this signal service now affords to us.

The time is not distant when no mariner will weigh his anchor, nor farmer reap his harvest before first consulting these weather forecasts, and when physicians and surgeons will both well consider them in the treatment of wounds and diseases.

Commercial nations in all time have endeavored in one way or another, to foretell coming storms so as to give necessary warning to vessels along their coasts, and the old Roman castles were provided with pointed rods to which the sen-

tinels in their rounds presented the iron points of their halberds; and if the contact evolved an electric spark, the alarm was sounded for the benefit of both farmer and fisherman, and although the instruments now used in taking observations, and the appliances by which the alarm is flashed from ocean to ocean, is a marvelous improvement upon the rude manner of accomplishing the same object by the ancients, yet so far as our knowledge of the generation or operation of the electricity in storms is concerned we are but little in advance of them. Observation had taught them that when the electric spark was seen there was danger in the atmosphere, and observation has shown us that electricity is the vital element of storms; but whether the electricity produces the storm, or the storm generates the electricity, no one has yet satisfactorily explained. There is, therefore, a great deal to learn upon this subject, and our people cannot do too much to encourage the speedy development and practical application of the scientific researches in that direction for the benefit and uses of man.—*St. Louis Republican, July 26, 1871.*

UNION MERCHANTS' EXCHANGE,
St. Louis, Mo., July 7, 1871.

To Gen. ALBERT J. MYER,
 Chief Signal Officer,
 Washington, D. C.

DEAR SIR: According to the suggestion in the circular of the Chief Signal Officer to the boards of trade, the undersigned were appointed a committee, by the Exchange of this

city, to confer from time to time with the Chief Signal Officer, and to take, in conjunction with him, such steps, or to recommend for the consideration of the Board, such action as may be deemed advisable.

We feel assured our community, and the members of our Exchange, highly appreciate the importance of this new Department, the recorded observations of which will become of more value every day, both for the safety of commerce and to our agricultural community.

We would respectfully suggest to the Department the importance to the commerce of the Mississippi Valley of regular official observations of the rise and fall of the waters in our rivers, at the cities and towns where there are stations, to be included in the daily telegraphic reports. These observations could be taken three times daily, and will have the stamp of official exactness to recommend them to our river marine, and will enable our boatmen to judge with much more certainty than now the amount of cargo they can load.

There are now working stations at the following cities, from which these river reports could be obtained: St. Paul, Davenport, Keokuk, St. Louis, Cairo, Memphis, New Orleans, Pittsburg, Cincinnati, Nashville and Omaha. We would also suggest to the Department the establishment, at as early a day as possible, of stations on the western slope of this Valley, that the climate and the meteorological phenomena of these interesting plains may be given to the public with that official authority that shall set at rest all speculation and doubt of their character, as stations on the Kansas Pacific railroad, midway from Kansas City, Mo., to Denver, Col., and one at the latter City would give much valuable information.

We would respectfully call your attention to the situation of the office here, being surrounded by manufacturing establishments, the smoke from whose chimneys materially affect such delicate instruments as are required for this service.

Your observer, Mr. Singleton, we commend for his devotion to his duties, and gentlemanly deportment. We would recommend his having an assistant, as the duties are greater than one man can perform satisfactorily.

Very respectfully, yours, &c.,

GEO. P. PLANT, *Chairman*,

WM. H. SCUDDER,

R. P. TANSEY,

Committee.

Weather and Water Reports.

Among the few benefits which the country has derived from the rule of the present administration, the system of weather reports, now in active operation, deserves to stand in the foremost rank. Inaugurated without any of that preliminary trumpet blowing, which is usually thought necessary in governmental experiments, it has made its way, against some opposition and much ridicule, to a position where neither the one nor the other need any longer be feared. People who laughed at the idea of adapting meteorological science to a purely practical, every-day use, and found food for amusement only in the formal bulletins from different sections of the country, now appreciate the work at its proper value, and derive from it information at once accurate and valuable. We do not doubt that this system has already been the means of saving a large amount of life and property on sea and land, and as prolonged experience and new discoveries bring it nearer and nearer absolute perfection, the sphere of usefulness must necessarily enlarge until it embraces the interests and the plans of all classes of community. The weather may retain its proverbial uncertainty, but thanks to the machinery set in motion at Washington, we shall be able to predict with

reasonable certainty what its purposes are, so far as the American continent is concerned.

The success of these reports, and the hearty appreciation they have gained in our own country and Europe, has encouraged the War Department to go a step further, and this time in a direction especially interesting to the citizens of the great Valley. On and after the 1st of January, 1872, the stage of water at all the prominent points on the Mississippi and its tributaries will be measured every day by Government officials, and transmitted by telegraph in the same way the weather bulletins now are. We understand that it is the intention of Mr. Singleton, Signal Officer at St. Louis, to have the reports ready by 4.30 P. M. every day, and posted on 'Change for the convenience of steamboat men and shippers. Heretofore the officers of a steamer starting upon a trip north or south were obliged to draw their information regarding the depth of the river from persons who had just traversed it, and whose interest or ignorance might induce them to give erroneous intelligence. Now, there can be no errors intentional or otherwise, and pilots will be furnished with figures upon which they may confidently rely under all circumstances. How much this simple device will facilitate navigation upon our western waters, we need not say, and Secretary Belknap is entitled to the thanks of the country for having thus recognized, in a practical and efficient manner, the value of that commerce which contributes to the wealth and prosperity of every portion of the Union.—*St. Louis Republican, December 21, 1871.*

The Late Tornado—Value of Storm Signals.

The late sudden and disastrous tornado, by which so many lives were lost, and an enormous amount of property destroyed, is another reminder of the importance of storm signals, to which we have heretofore alluded.

The science of meteorology, which has been too long neglected, we are pleased to see being rapidly and certainly advanced, by the regular observations of the Storm Signal Corps, and in the course of a very few years the prediction of the chief of this interesting bureau, "that a storm may be foretold with mathematical accuracy," will be realized. By this means the saving of life and property, on both land and sea, will be incalculable, if due attention be paid to its warnings of the approach of storms. Had the system been perfected and in operation, there is no doubt the lamentable loss of life on Wednesday last would have been prevented and much valuable property saved.—*St. Louis Dispatch*, March 10, 1871.

OFFICE OF THE DEPARTMENT OF PUBLIC LAMPS,
St. Louis, Mo., December 15, 1871.

Brig. Gen. ALBERT J. MYER,
 Chief Signal Officer.

Will you please send me copy of War Department circular, the "Practical use of Meteorological Reports and Weather Maps" lately issued by the Government, together with such other Signal Service reports as you may have. We rely much upon your weather reports in the matter of the lighting of the city, when using the light of the moon, and will be greatly obliged for the latest circulars or information.

Yours, very truly,

H. F. ZIDER,
 Superintendent Public Lamps.

NEBRASKA.

The Storm.

The storm which has now been raging here during the past three days, originated in the Rocky Mountains. It was first traced to Corinne, and was predicted in this city by the remarkable falling of the barometer last Tuesday. During the day it fell six-tenths of an inch. On Wednesday it began to rise, with threatening weather and high winds. At 4 o'clock P. M., on Tuesday, the thermometer in this city stood 82° , in the shade. At 4 P. M., yesterday, it was 37° , thus showing a fall of forty-five degrees. Warning was given of the approach of the storm as it traveled eastward forty-eight hours before it reached the lakes and the sea-coast. In former instances it has been clearly proved that both lives and property have been saved. This is due to the watchful and intelligent observations and reports of the United States Signal Service. Mr. W. B. Webster is the officer at the Omaha station. He takes careful observations with the most approved and nicely tested instruments, of the barometer and thermometer readings, the force of the winds, and the condition of the sky, three times each day. These are telegraphed east, and thus show to sailors and others what weather may be expected there, for it is a well-known law that storms usually travel from west to east.

That this storm has been both severe and aggravating in this locality, we need no scientific instruments to tell us. It has been more realized in all its ugly features from the contrast which it has so strongly presented with the bright and beautiful days and weeks which we have so often and so lately en-

joyed. Probably no climate in the world gives a greater number of clear days during the year than this of Nebraska.

Our State lies midway between the oceans, and is far removed from the lakes. For these reasons the damp fogs of either sea do not reach us. We rejoice in an entire absence of the atmospheric conditions which render England and our Atlantic seaboard, and the States bordering on the lakes peculiar homes of consumption.

We ought, therefore, to bear with the inconvenience of our wind storms, when they come, patiently. That is far better than lighting the lamps at mid-day, as they do in the fogs of London, or seeing our population decimated by consumption.—*Daily Herald, Omaha, April 21, 1871.*

The Weather Clerks.

During the first year of its existence, the “weather probabilities,” prognosticated by the Signal Bureau, have been verified at the ratio of sixty-nine per cent. This calculation is from the first annual report of the national meteorological service, and proves two things. First, that the officers of the Bureau are not afraid to pronounce impartial judgment on their own work; second, that the science of meteorology has attained a greater degree of perfection than was generally supposed. This first year of the labor of the Signal Bureau has been of incalculable benefit to the country in saving lives and property. Those engaged in its service have been learning while they have been working, and it is more than probable that the knowledge gained in the first twelve months will go far to render the bureau much more efficient in 1872.—*Daily Press and Herald, December 5, 1871.*

OMAHA BOARD OF TRADE,
OMAHA, NEB., *May* 24, 1871.

Brvt. Brig. Gen. ALBERT J. MYER,
Chief Signal Officer of the Army.

DEAR SIR: For the Meteorological Committee of the Omaha Board of Trade, I have the honor to acknowledge your communication of the 20th inst. This Board fully appreciates the importance of the work in which the Signal Office is engaged, and its advantages and wide-spread benefit to the business and general interests of the country, and will be pleased at any time to give you any information that will further the great object which you are so successfully carrying to important results for the whole country.

Permit me, in this connection, to say that the Signal Officer, (Mr. Webster,) in this city, has secured to himself the confidence and esteem of our citizens, and that the Board of Trade desires to add its testimony to his untiring attention to the faithful discharge of his duties.

Truly and respectfully, your obedient servant,

J. PATRICK,
President Board of Trade.

NEW JERSEY.

Weather Report System—Station Established at Cape May.

It affords us much pleasure in being able to announce the establishment at this point of a station for the observation and transmission of weather telegrams and reports for the benefit of commerce, and that the officer selected from the

Signal Service corps is the most acceptable one to Cape May the chief could have sent us.

Wednesday evening of last week Mr. Theo. F. Townsend, son of Capt. T. Townsend, of Seaville, in this county, arrived here, with instructions from the War Department to establish at once a station for meteorological observations, so as to be in readiness by the 24th inst., to fall in with the regular telegraphic circuits for the simultaneous transmission of reports to all the principal cities on the sea and lake coasts of the United States, in accordance with the plan so successfully inaugurated last November. Observer Townsend has selected the most central available point for locating his headquarters, where he will make his observations three times each day. Reports will be received by him from forty-seven other stations, and the promised coöperation of the officers and employés of the various telegraph companies insures facilities for the development of meteorological telegraphy unequalled in any other country. In addition to the regular tabulated reports of the weather, and so forth, Mr. Townsend informs us that he will receive, at twelve o'clock each night, a synopsis of the weather for the previous twenty-four hours. Of course these reports will be furnished the local press, and during the publication of our daily paper will be of great interest to our visitors in determining the "probabilities" of the weather.

Thus far the reports have wisely abstained from predictions except in the form of "probabilities," and these are limited to about twelve hours in the future. But higher and more important uses of the system are yet to come, whereby the movements of the severe northeast storms of the Atlantic coast, and other threatening changes in the weather shall be notified to passing vessels; and these are expected to hoist similar signals, so as to notify other vessels, so that all who come within the range of the system may be informed in due season of the perils ahead, and make their preparations, or run into harbor, accordingly. This will, perhaps, be the highest use of the Signal Service;

but if it be continued in full force, as it should be, there are scores of ways in which its observations and reports can be turned to the interest, the convenience, and even to the safety of the public, whose servant it is.—*Ocean Wave, Cape May, May 25, 1871.*

PRINCETON, N. J., *September 18, 1871.*

General MYER,

Chief Signal Officer, U. S. A.

DEAR SIR :

* * * * *

I take this opportunity to thank you, also for the daily reports and maps of the weather. The remarkable coincidence, in most cases, of the published probabilities, derived solely from the distribution of barometric pressure with the real atmospheric changes, confirms me in the conviction to which I have arrived long ago, that these changes are due to unequal pressure arising from differences of temperature and moisture. The electrical phenomena to which some are inclined to look for the hidden cause of the same are, in the rule, only the consequences.

I remain, dear sir, with sincere regard, truly yours,

ARNOLD GUYOT.

NEW YORK.

THE UTILITY of the system of storm signals adopted by the Government has been shown more than once. In December last a storm swept over the Western States, and its arrival at given points was foretold with the greatest accuracy, and the system then excited considerable attention. It is possible to calculate the effects of the two great forces which influence the atmosphere at ordinary times—the sun's heat and the rotation of the earth—and thus common atmospheric currents are well enough understood, but as all the forces at work at any given time cannot be subjected to analysis, the storm signals become invaluable aids in showing the elements of an approaching storm, and hence, in preparing to meet it. To-day, if the signals do not fail us, we are to have a storm of some violence. On the 14th the barometer was rapidly falling west of the Alleghanies, and a heavy storm of sleet and snow prevailed in Michigan and the Valley of the Mississippi; the barometers on the Atlantic coast were falling also, and the probability was that the storm would reach us on Monday. At the time of writing, rain, attended by lightning, is falling heavily, and everything looks as if Monday were to be moist and uncomfortable, if nothing worse.—*N. Y. World, January 16, 1871.*

THE February number of Scribner's Monthly has a very interesting and instructive article upon Weather Telegrams and Storm Forecasts, which we commend to the notice of all interested in storms on land and sea—as, indeed, who is not, in the face of the great destruction from cyclones and

other ravages of wind and storm? The telegraph has in no one thing been more useful than in noting the coming and moving of great storms. The seaboard is often made to know far in advance what a few hours will do, and to prepare for the consequences. A storm starting on the Rocky Mountains reached Lake Erie on the following day, and the warning had the effect of preparation and of saving valuable property, if not life. All along from Cheyenne, Milwaukee, Chicago to Cleveland, a storm last month was predicted with perfect accuracy, and it came with great fury. Information like this is not only important to the ship-owner and sailor, but the farmer, and the Signal Corps of the Government cannot fail to be of great service to the people.—*Evening Express*, Jan. 16, 1871.

Getting Ahead of Storms.

For a period of nearly three months the daily newspapers of our principal cities have been publishing a meteorological report, showing the actual condition of the weather at many important points of observation in widely separated parts of the country. Our own table includes reports, taken at about 8 o'clock in the morning, simultaneously, from Boston, Buffalo, Cheyenne, Chicago, Cincinnati, Cleveland, Detroit, Key West, Milwaukee, Mobile, Nashville, New Orleans, New York, Omaha, Oswego, Pittsburg, St. Louis, St. Paul, Toledo and Washington. Such reports are taken thrice daily, and they are furnished to the press and to the Boards of Trade gratuitously, for the benefit of the people. The service is performed by the War Department, under the immediate charge of the Chief Signal Officer, our former townsman, General Albert J. Myer.

The primary object of this beneficent work on the part of the Government is to foster and protect our inland and ocean commerce. It is expected that, by means of these

meteorological reports, notice may be given, on the northern lakes and on the sea-coast of the approach and force of storms. But the marine is not the only interest that may profit by this enterprise. The people generally will soon learn to look in the papers for the information, and a study of the reports will enable them to judge of the coming weather as effecting their several interests. The farmer will learn the probable course of rains. The butcher will be aware of cold currents, and will know when to prepare for killing and curing. Thousands will read the reports to see the condition of the weather at places where they have friends. The interest of this information will increase with the increase of the people's knowledge of the science of meteorology, a branch of study hitherto almost entirely neglected, but which will become more popular through the publication of these weather reports. What has been accomplished thus far is only a beginning. The future will justify the beginning, if the experiment shall have a future.

For, as we understand the matter, the arrangement under which this valuable information has been given to the public is only temporary, and further action by Congress will be needed to make it a permanent one. No agreement has yet been made with the several telegraph companies, over whose wires the reports are sent, for a fixed remuneration for the service. The companies were unable to specify a proper charge to the Government, and they very liberally agreed with General Myer to transmit the messages for an experimental period of four months, leaving it to the War Department to fix the remuneration for that time, and expecting that the knowledge gained would enable them to adjust a proper price for the future work at the end of the experimental service. The four months will expire, we believe, with the month of February, and then will come the question of whether the reports shall or shall not be continued. The result will depend greatly upon the liberality of the telegraph companies; for it is not to be presumed that Congress will consent that the War Department should

pay more than a reasonable sum for the service. We hope that the telegraph companies will see their way to dealing generously with the public in this matter, for, after all, it is the public with whom they will be dealing.

The definite contract, if one should be made, ought to involve some modification of the present arrangement. The reports are now sent over the wires at hours when they are the least occupied with regular business. This, perhaps, was all that could be done at first; but provision ought to be made for transmitting the reports at such hours of the day as shall be demonstrated by experience to be the hours best adapted to the success of the system in the interest of science and commerce. The reports published in the morning papers are taken at midnight; those published in the evening papers are taken at 8 o'clock in the morning; a third report is taken at 6 o'clock in the evening, but that is not published in the newspapers. We think that a noon report would be more useful than either of the reports now taken, and it could be published in the evening papers. This suggestion is made quite as much in the interest of commerce as in that of the press, for more vessels leave port after than before noon, and prognostications from noon weather reports would, therefore, influence commerce to a greater extent than from either of the other reports.

The experiment was begun too late last season to enable the Chief Signal Officer to report any great advantage as having been gained from it by our inland marine. The experience of any single season, however, even the whole of it, may not afford very startling results. What the Department hopes to accomplish, in this work, would surely be vastly beneficial alike to commerce and to science. After a time general deductions can be published from the central office, and signals can be displayed on our coasts, the same as are now displayed on the coasts of England, Ireland and France, to give notice of atmospheric conditions. All pains are taken to make the service accurate and efficient. The official observers are soldiers of the United States.

They are sworn by their military oaths to do their duty, and they are subject to military penalties for any neglect of it. They are examined as to general education before they are permitted to enter the Signal Service. Then they are specially educated for the duties of meteorological observers, and practised in the use of instruments. They are then examined by a board before they are allowed to go on duty. They are supplied with instruments of the best standards, and are taught how to place and use them. Their instructions are so precise that even the readings, made as they are at synchronous times, must also be made in the same order of precedence : thus, when the observer at Boston is at the barometer, the Cheyenne or San Francisco observer is reading his ; and so with the thermometer,—it is almost certain that the observers at all the different stations are examining their instruments at the same instant of time. The reports are corrected for elevation, temperature and instrumental errors, and are then so placed on the wires that the receipt of them at New York, New Orleans, San Francisco, Buffalo and other stations, is as nearly simultaneous as possible ; and when the reports are received at the central office in Washington it is known, by that fact, that they are received at all the other designated stations.

It is doubtful whether a more thorough telegraphic organization has ever been devised, but of course it will improve. The work in the United States has already attracted attention in Europe, and it is admitted that this country has now the most widely-diffused telegraphic weather reports of any country on the globe. It is difficult to imagine, and almost impossible to over estimate, the benefits that will accrue when years of practice and experience shall have perfected the hasty labors of to-day, and when knowledge and certainty will be attained in this interesting but difficult branch of science. It is not impossible that on the line of the lakes no storm will be encountered which has not been foretold and prepared for. The Chief Signal Officer estimates that three reports a day, allowing of intervals no longer than

eight hours, will be sufficient for the purpose. In his last report he says: "It would be rare that a storm of magnitude would progress more than three hundred miles in that period of time;" while "the fact that an extensive storm is moving in a certain direction, and its movement and force reported at intervals of a few hours, as it reaches the different stations in its course, will, of themselves, be a warning to points further in the track of its probable progress." The Atlantic coast stations from Florida to Maine are, or are to be, filled with these weather observers. The general movement of sea-coast storms is from the south to the north, and it follows that storms passing these Atlantic stations can be reported some hours before their arrival.

The whole subject of "Weather Telegrams and Storm Forecasts" is ably treated in the current number of Scribner's Monthly, and is finely illustrated. The next number will contain a continuation and the conclusion of the article, in which the American system, (which we have thus endeavored to give an idea of,) devised and operated by the Chief Signal Officer of the Army, will be fully described and illustrated with accurate drawings. We commend the subject and the magazine to all intelligent readers who would keep themselves *au courant* with one of the most important and interesting of the scientific movements of the age.—*Buffalo Commercial Advertiser*, January 23, 1871.

Storm Telegrams.

Under the wise and energetic supervision of Gen. Myer, Chief Signal Officer U. S. Army, the act of Congress for instituting a proper system of storm observations, and publishing in the press a daily report of the same, has become a fixed fact, and by its good results is daily evidencing the wisdom of the measure. It should be remembered that the undertaking will have its defamers. Every great measure

for the public good has met such opposition ; and the system now under consideration, when adopted in Europe, had for years its bitter enemies, even among the classes whose lives and property it was intended to save. But one of the leading journals of Great Britain now says of the Storm Bureau of that nation: "Its services, in the saving of life and property, are of the most valuable character. There is no intelligent officer of the Government, or business man, but would give his vote for its continuance and increased efficiency."

There needs, however, in this country—as was the case abroad when the system was first adopted—to be much effort put forth to give the public a better understanding of what it is proposed shall be accomplished by the storm telegrams ; and also the amount of evidence there is that the whole scheme is feasible and practicable. We are glad, therefore, to be able to say such information is being prepared by competent hands, and is even now being placed before the public.—*Bureau, February, 1871.*

Extension of Storm Signals to the Pacific.

After to-morrow, February 1, regular Weather Reports will be received at Washington three times a day, from Corinne, in Utah, and San Francisco, in California. The system of storm signals which has so frequently been advocated by the *Herald*, and the adoption of which has already commended itself by important direct or indirect advantages, will thus be extended from the Atlantic to the Pacific. The first of the recent heavy snow storms came, according to unanimous reports, from the Rocky Mountains. The presumption is that these storms came from the Pacific. One important scientific question to be decided by the storm signals is whether this was actually the case, proving that some of the storms hitherto supposed to sweep from the

Atlantic over the country, on this side of the Rocky Mountains, have, in fact, swept from the Pacific across the lofty Sierra Nevada and the Rocky Mountains. It may be expected that the system of storm signals will have been so greatly perfected and extended within a few months as to satisfy the public that we have not exaggerated the immense practical services which it is capable of rendering. This system will effect a saving of life and property on both land and sea, which will be incalculable if due attention be paid to its warnings of the approach of storms, from whatever direction. —*N. Y. Herald, January 31, 1871.*

The Magazines.

Scribner's Monthly for February, the fourth issue of this delightful new literary venture, comes freighted full of fresh, vivacious, sparkling prose and poetry, thus admirably sustaining the expectations that its first appearance awakened. Mr. Hassard's instructive illustrative article on "The New York Mercantile Library," alone guarantees a hearty welcome, and Professor T. B. Maury's valuable contribution on "Weather Telegrams and Storm Forecasts," with notes and diagrams, is worth the subscription price to the reader. Young folks and old alike will be pleased with the continuation of the story of "Lucky Peer," from Christian Hans Anderson's genial pen. But these are accompanied by a rare selection of timely and varied themes ranging into the realms of history, poesy and romance, followed by editorial gleanings and annotations concerning "Home and Society," "Books and Authors at Home," &c., &c., which do credit to Mr. Holland's industry, as well as to his recognized talent. The abundance, novelty, and merit of Scribner's Monthly must command success.—*N. Y. Herald, January 13, 1871.*

Weather Probabilities.

The Government has but recently entered on a novel and most interesting branch of work—that of forecasting the weather from barometrical and thermometrical indications in widely separated parts of the country. We bespeak for the labors of the “Signal Service Bureau,” as it is called, the patient and tolerant judgment of the public. Meteorological science is yet in its infancy; but it is a science, not a quackery, and its assiduous cultivation will yet give it the desired exactitude. The system has now been in operation but a short time. Observers have to be educated; the best points of observation have yet to be determined; the laws of the weather have yet to be settled by repeated comparisons and results; the officer at Washington who makes up his daily estimate of the “probabilities” for every twenty-four hours has yet to gain his stores of practical experience. Notwithstanding all the defects incident to the development of so difficult an art as foretelling the weather, the bulletins that we daily publish show that it can be done, even thus early in the efforts, with a great degree of precision. The general character of the weather in the Atlantic States (and we suppose also in other parts of the country) has been several times predicted with remarkable accuracy. We impress upon all those who consult that portion of our paper the importance of reading the estimation of “probabilities” with care. It will be seen that the predictions are rarely positive. They are qualified with plenty of “ifs” and “buts,” as they need must be in the present imperfect state of meteorological science. But it is of great value to shippers and travelers to have even the probabilities of the weather given, when experience proves that these in most cases come true. In all the affairs of life men go upon probabilities. The success of the experiment up to this time warrants the belief, however, that after the apparatus shall have been put in complete working order, and the staff of observers become weather-wise through much practice, the

predictions will take on a more definite form, and perhaps be as reliable as those of tides and eclipses. There are fixed and unerring laws regulating the weather, and it but remains for human ingenuity to find them out and apply them.—*Journal of Commerce*, February 25, 1871.

The Government Weather Reports.

We have been carefully watching for some days past the daily weather reports of the Government Signal Service Bureau, and its statements of the condition of the skies in different parts of the Union, the courses of the great storm currents, and the probabilities of the weather for a day or two ahead, east, west, north and south; and from these observations we are satisfied that this meteorological institution is in a fair way to render signal service to the country on the land and water in regard to approaching and disappearing storms. For instance, in the official weather report of Sunday last, from Washington, at 11.25 P. M., after noting the winds and rains in different sections of the Union, the opinion is given that on Monday "fair weather, with fresh winds, will probably prevail on the Gulf and Upper Lakes, and brisk winds and clearing-up weather on the Atlantic coast and Lower Lakes." The report for Monday is a complete fulfilment of these predictions. This late storm or "wet spell" covered so much of the country east of the Rocky Mountains that in breaking away the whole intervening country has cleared up.

We say we have great hopes from this Signal Service Bureau of signal service to our landmen and seamen, especially our coasters. The season, too, is near at hand when, with the breaking up of the winter, we may expect heavy floods and freshets, especially in those rivers which drain off the surplus water from our melting mountain snows, and here our Washington meteorologists may prove themselves

eminently useful in giving in the most important cases a seasonable warning of a coming storm. The Bureau is doing very well, and is making some very interesting discoveries in relation to the movements of our storms from the west to the east, and from the south to the north, and we should like to see the area of its operations still further enlarged.—*New York Herald, Feb. 28, 1871.*

STORM SIGNALS and weather portents are only just beginning to have their full importance recognized by our commercial and agricultural community. It will probably require a still longer time to convince the general public how much we owe to the Washington Bureau, whose painstaking efforts furnish us with the daily "Synopsis of the Weather." To attain something like faultless efficiency, the "Division of Telegrams and Reports for the benefit of Commerce" have only to send out their reports earlier in the night.—*New York Times, February 28, 1871.*

The Battle of the Equinox and Our Storm Signal Service.

Already the battle of the equinoctial elements has opened. Judging from its beginning, there is reason to apprehend a violent conflict. Within the next ten days, it is not improbable the whole country may be swept by storms and cyclones, whose fiery track will be sprinkled with the ruin of houses and the loss of human life.

We have just had accounts from the west of the fearful tornado in East St. Louis, which reaped a fine harvest of destruction; also of one in Memphis, and still a third in Mobile. The loss by the first of these alone was at least seven lives and one million dollars. It is a fact well known

to meteorologists, and to be seen on their isobaromic charts, that at this season the atmospheric pressure over all North America, between the sixtieth parallel, north latitude, and the Gulf of Mexico, will diminish and continue to diminish until July. The low barometer in the United States, meantime, will necessarily invite heavy storms from the two oceans that wash their shores, and also from the Gulf, via the Valley of the Mississippi—a favorite highway of tempest.

It most unfortunately happens that at this very time the operations of the Signal Service, whose weather telegrams and storm warnings have already proved so beneficial, are interrupted and thwarted by the Western Union Telegraph monopoly. The demands of this corporation for the service rendered to the Government were originally far beyond the limits of moderation, and would have absorbed twice the appropriation Congress made for the Signal Service. That these demands were unreasonable was evinced by the fact that the Franklin Telegraph Company—a much feebler and poorer institution—came forward and offered to do the work on much lower terms, and on the terms fixed by General Myer. The lines of the latter company, however, not extending to all the southerly and western stations of the Signal Service, their proposal could be accepted only in part.

But whatever may be the issue of the controversy between the monopoly and the Government, the people throughout the whole country will be greatly disappointed and annoyed at any interruption to the new service. Happily for American commerce and science, it is not now necessary to appeal to the English storm signal system to justify and illustrate the utility and importance of our Meteorological Bureau. Although it is yet in its infancy, and needs patient and fostering care and a liberal endowment, it has already won some laurels, and its daily bulletins of weather probabilities have been generally most signally verified. The percentage of “probabilities” fully verified (according to the modest estimate of the officer at the head of the enterprise) is fifty

in every one hundred, verified in part twenty-five per cent., and failed twenty-five per cent. It should, however, be borne in mind that the failures have been, in a measure, due to the lack of information by telegrams from stations not yet established. A most beautiful illustration of the value of the service was given last month. The tremendous storm which wreaked its fury on San Francisco on the 21st of February was closely tracked to Corinne, Utah, across the Rocky Mountains to Cheyenne and Omaha, and storm warnings of its approach were issued thirty hours in advance of its arrival to Chicago, a longer time to Milwaukee and Cleveland, and two days' forewarning were given to Buffalo and Oswego. The storm, which in crossing the Rocky Mountains had broken off only the base of its revolving column, ravaged Chicago, Milwaukee and Cleveland, unroofing and overturning houses; it struck Buffalo and Oswego with great violence in its course, and finally passed out into the Atlantic. Had navigation on the lakes been open, doubtless the forewarning had been the saving of many lives and richly freighted ships.

By rights the Signal Service should have been instituted for the benefit of commerce at the same time that Admiral Fitzroy's system was established in England, more than ten years ago. It is to be earnestly hoped its operations may suffer not another hour's suspension. The knowledge of American storms to be gained at this season is too important and invaluable, both to the Signal Service and the country, to be lost or tampered with.—*New York Herald*, March 14, 1871.

Forecasts of the Weather.

We alluded on Saturday, in respectful terms, to the sort of weather they deal out to the country at Washington, and remarked that on the whole, the administration of the

weather was not as satisfactory as it might be—in short, that the army was rather overdoing the thing. The three and a half days' continuous rain of last week, and the storm of last night and this morning, justify our remarks, and lead to the belief that a second deluge is really imminent. The "probability" for Saturday was "cloudy and clearing up weather along the Atlantic coast," these words being finally verified in the beautiful Sunday that smiled upon us. The probability for Monday was "falling barometer with partially cloudy weather." We had all that and something more as the rain came down all Monday night in cataracts. The "probability" for to-day is "gentle and fresh winds on the Middle and East Atlantic." We hope to feel them before night, and to see these lowering clouds disappear. A good deal of interest is taken in the "Signal Office" reports, and the modest statement of "probabilities" very often meets with remarkable verification. Storm and weather forecasts are by no means impossible, and close observation will soon clear away some uncertainties that cloud the predictions, and give to the announcements of storm prophets a more positive value and a stronger claim upon public confidence. Every day the importance of the Signal Office reports increases, and they will do for us more even than was accomplished by Admiral Fitzroy in England. Science slowly grapples with the most doubtful problems, and in its untiring search for the law that governs what seems to be caprice and nothing else, is sure to meet with success.—*New York Commercial Advertiser, March 21, 1871.*

Our Storm Signal Service.

This enterprise is fast becoming an important arm of our national service. In 1854, while the Anglo-French fleet was securely riding the waters before Sebastopol, the telegraph announced to its admirals that a fearful storm was moving

from the west, and would doubtless sweep the Black Sea. The telegram was sent by Marshal Vaillant, the then Minister of War of France, and was despatched from Paris a few hours after the storm came in from the Atlantic and broke upon the French Coast. The announcement was timely, and it is, perhaps, not impossible, that but for the receipt of that telegram the assembled navies of the allied nations might have gone down before an enemy more to be dreaded than the fire of all the Russian forts. In the instance mentioned, the fleet, with few exceptions, put to sea and outrode the gale; while the troops on shore suffered untold misery and loss from the fury of the celebrated "Black Sea Storm."

The grand success of this first experiment in utilizing the electric telegraph for forewarning shipping was followed up in this country, and in 1857 a formal proposition was made to organize a system of telegraphic meteorology extending from one end of the land to the other, and far-storm warnings to all our lake and Atlantic sea-ports.

The practicability of forecasting and predicting the approach of our great storms has often been demonstrated, and is being illustrated afresh every day, in England, Holland, France, Italy and Germany. Indeed, several striking verifications of the great value of our system have been given by the late bulletins of the Signal Service officers of the lakes, by which there is reason to believe several fine ships, with cargoes valued at several hundreds of thousands of dollars have escaped the violence of this winter's tempests. A large ratio of the storm forecasts of the Signal Service has been verified with astonishing precision.

The weather is a subject in which all classes are deeply interested. If buyers and sellers in the grain market and other connected branches of business would take note of our daily weather telegrams from all parts of the United States they might be much less in the power of heartless speculators. These telegrams have already proved highly useful to farmers and planters. The value of the out of door laborer's time would be greatly increased if he could know a day

beforehand that upon the coming day his ordinary work would be suspended. Though eminent meteorologists have doubted the wisdom of attempting daily weather forecasts, at least negative information, (such as non-occurrence of storms,) and also positive information as to the suitableness of the coming weather for traveling farming and gardening operations, the growth of crops, and for many other objects and purposes of human life, could be obtained from daily telegrams received from a wide field of observation.

To be effective, however, the system must extend its observatories over all parts of the continent, and furnish them with the best instruments, to be handled by the ablest scientists. This cannot be done without a liberal appropriation, and this, it is to be hoped, will not be refused, considering the importance of the promised results. General Myer deserves all proper assistance and encouragement in his work. —*Mercantile Journal*, March 23, 1871.

Discontinuance of the Weather Reports.

It is only some few months since the daily publication of reports of the weather at various points was commenced, but during that period they proved valuable in so many instances that we regret to learn that for the present these records are to be discontinued. This intermission is particularly unfortunate just now, because during the next few months it is of the utmost importance to our agricultural community to be able to form some forecast of the weather. The farmer regulates his plowing, seed-sowing, and harvesting according to his opinion of the weather probabilities, choosing for each operation the particular season and time when it can be performed under the most favorable circumstances. During the winter months the reports have been chiefly valuable to mariners, many of whom have thus been able to protect themselves and property from storms announced by tele-

graph as approaching from some distant point. The cause of the cessation in publishing these reports is the expiration of the agreement made with the Western Union Telegraph Company for their transmission. The original arrangement was only for four months, during which time the number of stations has been considerably increased, and the reports proportionally lengthened, so that the telegraph company found it a serious impediment to their business to be compelled to give up their lines for the transmission of such messages even twice every twenty-four hours. The price stipulated for this service was placed at a very low figure, so the company, naturally enough, was not anxious to renew such an unprofitable contract.

The experiment of a complete and regular weather report has been sufficiently tested to prove its value to commerce, and to demonstrate the important assistance it may give to farmers and horticulturists. Of late the system of collecting and collating meteorological reports has made such progress that the Signal Department in Washington has felt warranted in making forecasts for twenty-four hours at a time, which have been realized with tolerable accuracy. This work, as it progresses, will become of more and more national importance, and cannot well be left to private enterprise, as has been suggested. If the Government employs the observers, and compiles the records, it will not do to allow telegraph companies to sell these results, as they sell other news. Nor is the prospective profit derivable from such a sale likely to prove large enough to induce any private company to attempt an independent collection of weather observations on as large a scale as it has been organized by the Signal Service. The only statement explaining the cause of the discontinuance of reports we have seen is the one published by the observer in charge of the New York station. If Gen. Myer, the Chief Signal Officer, fails in his efforts to make any arrangement with the telegraph companies, the public will be duly notified, and it will then be easier to tell whether the farmers are to have the benefits of weather reports and forecasts

during the coming season. As some New York dailies still continue to publish a synopsis of the weather reports and the forecasts, it is not improbable that the papers elsewhere may follow their example, so that farmers who can obtain the daily papers may not be entirely without meteorological information, even if the full reports are discontinued for some time to come.—*Hearth and Home*, March 25, 1871.

THE WEATHER-WISE CHAPS of the War Department are really earning an excellent reputation as trustworthy prophets. So far their meteorological speculations have been remarkably accurate, and public incredulity is rapidly yielding to a formidable array of verified predictions. Agreeably to the statement that the “high barometer” (which, on Saturday night, was over Maryland,) moved eastward on Sunday until it became a “low barometer,” we are now enjoying a rainy interval; but the “Boss” at Washington adds the comforting “probability” that it will clear up before sunset to-day. Persons interested to test these vaticinations would do well to note them down from time to time, and compare them with the actual state of weather.—*Commercial Advertiser*, March 27, 1871.

Weather Prophecies and their Fulfillment.

The weather markedly fulfills the predictions which were contained in the “probabilities,” as stated in the weather report issued from Washington at 10.30 A. M., yesterday. “Threatening and falling weather on the East Atlantic” was contained in the report, as inferred in the summing up of observations which had just been received from all the various stations on the continent. We refer to this subject to show how almost unexceptionally accurate are the con-

clusions reached in reference to the coming atmospheric variations by the officer in charge of the Meteorological Bureau at headquarters. Our readers will find it interesting hereafter to note the predictions, and comparing them with the state of the weather that for twenty-four hours succeeds their publications.—*New York Daily News*, April 4, 1871.

THOSE GOLD MEDALS for the Washington meteorologists that everybody is thinking about, and nobody seems moving to confer, ought to be struck off at once. Heretofore all weather prophets have been a sort of public laughing stock, but the sky-gazers and cloud connoisseurs of the War Department have, in a few short weeks, put our skepticism to flight by a series of brilliant vaticinations that reduce weather prophecy to the proportions of a positive science. Therefore, trot out your gold medals for the chaps who can so unerringly tell us whether our new beaver or “that gingham umbrella” will be in order for to-morrow.—*Commercial Advertiser*, April 15, 1871.

Meteorological Observations.

According to plans now partially matured, and which promise soon to be carried into execution, a grand National Observatory will be established on the Equitable Life Insurance Building, corner of Broadway and Cedar streets. This movement is taken in accordance with repeated recommendations of the New York Chamber of Commerce, and with the coöperation of that body. The point chosen is one of the most conspicuous that could be selected for the display of signals, and the Equitable Life Insurance Company is entitled to credit for its action in this matter. Though not enabled to speak definitely, or with authority, (as Mr. Weston,

civil engineer, to whom the subject is committed, has not perfected all of his arrangements,) we understand the design is to place the contemplated observatory in communication with the meteorological apparatus at Washington City, so that public signals may be given in New York three times a day. For this purpose two heavy poles will be erected on the roof of the Equitable buildings, and such other works as may be required.

We readily conceive that apparatus of this character may contribute very much to the advancement of mercantile interests, by making instantly intelligible for the guidance of mariners about going to sea, full information respecting the movement of wind and storms in any part of the country, or along the coast. It will also be practicable to indicate the true time, mean or sidereal, but an observatory, in the ordinary sense of the word, cannot be thought of anywhere near a large city, on account of the tremor caused by moving vehicles, not to speak of the impurity of the atmosphere. If the project is realized, we may expect a great improvement as compared with the "time ball" in Wall street, which some years ago recorded observations taken at the Observatory in Albany.—*New York Commercial Advertiser*, April 20, 1871.

Storm Predictions.

We have often spoken with confidence and respect of the accuracy of the weather predictions made up at Washington, by the Signal Department; but if these "probabilities" are not soon altered in tone, our feelings and those of the public will suffer a change. It is not the predictions to which we object. They are all right. But it is the kind of weather these meteorologists choose to distribute over the country. While they are about it, why do they not offer "probabilities" of pleasant weather occasionally? As it is, they send

us only one perpetual round of "depression," "cloudy and threatening weather," "hard rains," &c. If it be possible, let the reader recall the weather for the past three days, while we overhaul the forecasts. On Tuesday evening, at 7.30, the Signal Office predicted "cloudy weather and light rains along the Atlantic coast" for Wednesday. It was cloudy all day. It sprinkled at 10.30 A. M., and at other times during the day, and everybody went around with an umbrella. In the evening rain set in. In the meantime, by way of clinching the evil prognostication of Tuesday, a despatch came at 10.30 A. M., on Wednesday, which quietly observed that "cloudy weather would continue." At 7.30 A. M., of that evening, we were notified that on Thursday there would be "cloudy and rainy weather." It rained pretty much all that day and all night. On Thursday morning the cheerful forecast was followed up by another at 10.30, which informed us that "no material change is indicated," and now, under date of 1.30 Friday morning, we are notified that the probability for to-day is "Easterly winds, followed by southwest winds, and abating rains in the Middle and Eastern States." "Abating rains," indeed, why not brought to a full stop? Now let us see if the rest follows with that fearful certainty which has attended the gloomy prognostics of the past few days. We are completely at the mercy of the Signal Office, whose central divinity, from his secure indoor seclusion, sends storms and clouds and frosts at his own sweet will. How soon he will issue earthquakes and typhoons we cannot say. There is one great consolation in all this, which is that he is not exempt from the consequence of his own prevision, but that he, too, is the victim of the calamities he inflicts on others. It is by no means eternal sunshine where he sits, and if seismic movements are predicted, his tripes may be tottered down, even as was the temple of Dagon on the powerful Samson.—*New York Commercial Advertiser*, May 5, 1871.

Sayings and Doings.

Very convenient is it in these scientific times to open a morning newspaper and learn from it that the "probabilities" are you may take a drive in Central Park, invite your friends to dinner, or start on a journey any time within the next twenty-four hours, without fear that a storm may overtake you or disturb your plans. But this is by no means the most important use of the American Storm Signal Service, which has now been in successful operation for several months. Its daily reports, and the "probabilities" annexed, are of great value to the commercial and agricultural interests of the country. This service is a branch of the War Department, being under the charge of General Myer, assisted by an efficient staff of officers, and a corps of about seventy-five sergeant observers, who have either been promoted from the regular army service, or specially enlisted for the purpose. They are required to pass certain examinations, and are subjected to regular army discipline. There are about forty stations of observation, located in all sections of the United States, but particularly on the sea-coast and the northern lakes; and these are in direct communication with the headquarters of the Chief Signal Officer at Washington. Three times a day simultaneous meteorological observations are taken by well-trained observers at these stations, and telegraphed to the central office, where they are carefully examined and studied, a synopsis made out, and also the "probabilities," which are published in the principal daily newspapers, and announced by bulletin in all the boards of trade and chambers of commerce in the country. If there are indications at any station of a sudden storm, immediate warning is given by telegraph; and in general the "probabilities" of approaching weather, daily issuing from the Signal Office, have been most strikingly confirmed. The Signal Service has but just commenced its labors; but in course of time, as instruments become perfected, and experience and observation increase, it is hoped that a system of

storm signals will be established along our coasts, so that violent and sudden storms or winds may be signaled to vessels by day and by night, and thus many lives and much property be saved.—*Harper's Bazaar*, May 6, 1871.

Storm Signals on Broadway.

On a lofty building at the corner of Broadway and Cedar street a telegraphic meteorological establishment will soon be erected in connection with the Signal Service Bureau at Washington, and other points, whereby our outward bound mariners will be informed of coming storms in season to avoid them or to trim ship and shape their course to meet them. This Signal Service Bureau, in its daily weather reports, has already established a great reputation in the accuracy, as proved from day to day, of its "probabilities." These scientific men have solved the mystery of the laws of storms in the United States, and we think that this Government service is destined to be of incalculable value to the country, on the land and the sea.—*New York Herald*, May 7th, 1871.

THE ACCURACY of the War Office weather reports has made them a matter of daily business and family importance. It is not only our seagoing element that closely scans them nowadays. The fine ladies and the jaunty swells all anxiously study them in the morning before they decide upon a promenade, and scan them in the afternoons before they decide to go to the theatres or churches. Every morning the question of business men, after the usual inquiry relative to stocks, is, "What is the weather going to be?" and thereupon they consult the War Office reports in the Herald.—*New York Herald*, May 7th, 1871.

Value of the Weather Reports.

We have heretofore called attention to the correctness of the weather reports furnished by the Government, and printed daily in the *Press*, and to the accuracy of the forecasts under the head of probabilities. It is a matter of interest and importance to know how far these reports are useful, and how much reliance is put on them by the classes of persons for whose benefit they are designed. So far as the reports at this station are concerned, they are likely to be of most service to lake navigators, vessel owners, and shipping merchants. At first sailors pooh-pooled at the idea, but Observer Sergeant Hough tells us that now they come to him frequently before sailing to learn the probabilities of the weather, and they seem to place considerable reliance on the information they get. This is certainly an encouraging sign, and if the Government gets as favorable reports from other stations it must be gratified.—*Oswego Daily Press*.

About the Weather Reports.

We remarked last week that the weather reports at this station are assuming practical value, and that vessel masters are beginning to show their confidence by inquiring at the office about the weather prospects before sailing. Since that we learn incidentally from Observer Sergeant Hough—who, by the way, is a very competent and obliging officer—that this thing goes further than we had supposed. Painters, builders, and in truth almost all classes of out-door workers, come to him very frequently to ask what the weather will be, and seem to put faith in his forecasts. We consider this noteworthy, as showing the confidence a regular system of observations is inspiring in our own community.—*Oswego Daily Press*, May 22, 1871.

The United States Storm Signal Service Weather Charts and Reports.

Many were inclined to regard the establishment of the Storm Signal Service as an unnecessary and useless measure. It was imperfectly comprehended how it could be of any service to the country at large. That telegraphic messages could travel faster than thieves, had been fully demonstrated. That they could also travel faster than storms, was generally believed; but storms were generally supposed to be so erratic in their movements, that people were slow to believe that a report of a storm raging at Leavenworth, Kansas, could be of any practical benefit to New York; or that the knowledge of the state of the weather in Maine could be of any service to the inhabitants of Florida.

The reports are, however, daily demonstrating their value. The usual courses of storms are becoming better and better defined; their average rates of progress are now practically determined; and the predictions based upon the study of the daily weather charts are generally correct. The weather reports now form one of the most interesting and valuable features of the daily newspapers, and are looked for with eagerness by all classes of intelligent readers.

As an instance of the practical value of these reports, which, however, hardly needs any further testimony, we may cite the following from the *Carson (Nevada) Register*. That journal says, that "on the 19th of April, a terrific storm originated in the Rocky Mountains, starting southward; but on reaching Corinne, Utah, it turned eastward. Its course, as it varied, was reported by telegraph all over the country. The signal stations on telegraph lines are all furnished with the weather instruments heretofore alluded to, so that when the storm raged north of Corinne, and was reported by telegraph at Omaha, the report was sent no further, as the instrument at that point gave no sign of its approach. The moment it turned east from Utah, the barometer at Omaha told, more surely than the telegraph, that the storm was com-

ing, and it was telegraphed on to the lakes, where the shipping was put in readiness to receive it forty-eight hours before it arrived. Thus did this admirable system save life and property by its timely warning.”—*Scientific American*.

Meteorological Reports.

The United States Signal Department has placed in the Board of Trade rooms a weather chart, showing the meteorological stations recently established throughout the country. The telegraphic report of observations taken synchronously at the stations at 7.28 A. M., (Buffalo time,) will be placed upon this map as soon as received; the weather at each station being indicated by appropriate symbols and figures readily understood, and by which the location and progress of storms can be observed at a glance.

Masters of vessels especially are invited to avail themselves of the facilities offered at the Board of Trade Room and at the Signal Office, for obtaining information that cannot fail to be of great interest and benefit to navigation. Free admission to the rooms of the Board of Trade is allowed to all shipmasters in active service.

ALONZO RICHMOND,
GEORGE S. HAZARD,
JOHN H. VOUGHT,

Meteorological Committee, Board of Trade.

Buffalo Courier, June 9, 1871.

The Weather Bureau at Washington.

In a country like ours, where there is no considerable portion of it that has long periodic terms of constant, unvarying heat or cold, or of humidity or dryness, the one extreme succeeding the other, the weather is a subject of frequent

notice and conversational remark. This interest in the state of the weather where it is liable to fluctuations, is not to be wondered at. The great material interests of the larger portion of our people, involved in the various pursuits of agriculture and marine commerce, find in the weather their auxiliary or instrument, or their foe and injury, as the case may be, while all classes of men are both consciously or unconsciously affected by it, physically and mentally. The latter assertion is readily susceptible of philosophical explanation, but it is so generally received as fact, that we need not proceed to a demonstration at this time.

But if the state of the weather is for the time being a matter that attracts much attention, the art or process of divining what it shall be days or weeks ahead, becomes one of greatly enlarged importance when it can be applied to solving the question for a country extensive as ours. With the aids that science has furnished in this direction, private persons have made prognostication with reasonable certainty of fulfillment over a small district; but with the organized corps and machinery which have been established by the general Government, the problem for the whole country itself has become a comparatively easy task. The difficulty of making calculations for a large number of districts is in no sense to be estimated upon the basis of the extent of country they may cover. The greater the area and the more numerous the points of local observation, the greater the certainty and the ease of making calculations for local districts, as well as for the whole land.

We don't know at whose suggestion the Administration went into this enterprise. We think neither the press or politicians ever started it. It has, however, been a wished-for institution among men of science practically acquainted with the barometer and other instruments used in meteorological observations. To them the undertaking has always appeared feasible, and upon the plan as adopted at Washington. It has been put in operation without any noise, and is quietly at work stretching its electric feelers all over the

country east of the Rocky Mountains, and penetrating them in a line across to the Pacific. There are at least forty places of observation beside the Rocky Mountain stations and those westward, and the notices made by the observers include, as we suppose, the range which science would dictate. These report to the grand centre at Washington, at the pleasure of the latter, and upon these aggregated reports it can be easily discerned where the areas of high and low pressure are, and thereupon determined the highly probable course of the wind which is to follow, and also as to the other features of the weather which are probable to prevail. The machinery of the organization is simple, and can not require a very large sum of money to run it. We endorse the enterprise as a highly useful one, and commend the Administration for prosecuting it. It is yet in its infancy, but able to accomplish more work in an hour than all the weather astrologers ever wrought since time began with man. Its utility is not yet appreciated, because confidence in it has not been fully established. That it will soon be generally consulted, we have no doubt, nor will any one who thoroughly understands the means used and the principles which govern and guide those means.

We shall resume the subject, and endeavor to explain in our next the agencies employed in operating the institution.
—*New York Times*, June 15th, 1871.

The Signal Bureau.

It is under this head that the weather reports are daily sent from Washington, the centre of the system of observations recently instituted by the Government. We briefly adverted to the subject yesterday, and to-day renew our congratulations to the country upon the adoption of the enterprise, and our thanks to the Administration for boldly undertaking it, since it requires no little courage to take a step

so much in advance of the action of all other governments, in bringing to practical subservience to popular behoof and comfort, the revelations of science and the appliances of art.

The state of the weather depends upon the conditions of the atmosphere, which include its comparative weight, moisture, (tension of vapor included,) temperature, and degree and course of motion. The weight is determined by the barometer, the principal instrument used everywhere to ascertain the probabilities in respect to coming weather. It simply weighs a column of air immediately above the place of observation, but inasmuch as the weight of the column at the level of the sea has been ascertained to be equal, in ordinary fair weather, to that of a column of mercury thirty inches in height, (or a column of water about thirty-four feet,) any deviations from that height, (except from altitude above the sea, which sinks the column about .008 inch for every ten feet of elevation above tide-water,) indicates that the air is not in a state of equilibrium. It is, therefore, the flow of air from one quarter to another, that causes the fall of the mercurial column at the former, and a subsequent flow of air from some quarter to the former, that causes the rise.

The atmosphere is undoubtedly never at rest all over the globe, nor any considerable portion of it. This country is mostly included in the dominion of the "variable winds," and hence the atmosphere covering it is generally in motion. It is this continual motion of the air that causes the winds, which are the mainsprings of the weather, and it is the barometer that determines how to foretell them. By careful observation of the effects of the varying indications of the barometer, something of a system for prognostication of the weather has been adopted generally as correct. Some of the rules are absolutely certain; as for instance, when there is a fall of the mercury of an inch in half a day, tempestuous weather will follow; or when there is a fall of a half inch in an hour, a hurricane will come. There are many other rules deduced from observation and experience, that are reason-

ably certain of fulfillment. The slow and steady sinking of the mercury for the term of a week or more to the extent of an inch, foretells a long rain. On the contrary, a slow rise of the mercury, (as we have observed it on one occasion,) such as attaining "Fair" point, at the steady progress of a half inch in three weeks, will be followed by at least that amount of quiet, dry weather. In short, there are rules by which the experienced observer can, in nine cases out of ten, foretell gales, rains, snows, frosts and thaws. But these rules are very unsafe in the hands of a tyro, as there is sometimes a very wide "margin" for conjecture; and a glance ahead, to be reliable, requires due allowance for the demonstration of the barometer quite a while in the past. At some other time we will furnish a set of hints on this subject of observation and prognostication.

We are not advised as to the list of instruments employed by the Signal Bureau, but their tables, as published in some of the New York dailies, show that, beside the barometer, the thermometer and anemometer must be used. The thermometer measures the heat for two purposes—one for ascertaining the temperature of the locality, and the other for a basis to correct to a common standard the barometrical table figures. The anemometer measures the force or velocity of the wind. We don't know whether or not the hygrometer and psychrometer are used. The first measures the moisture of the air, and the latter the tension of that moisture. These are important aids in determining the probabilities as to rain or drought, and if not now used, doubtless soon will be.—*New York Times*, June 16, 1871.

Weather Predictions.

The predictions of the weather, which regularly appear as they are transmitted from the "Office of the Chief Signal Officer in Washington," must have attracted public atten-

tion by the uniformity of their fulfillment. The relation between the probabilities and the future facts indicated has been especially remarkable within the last few days, and must have taught those who observed it closely the value of consulting the meteorological reports which are regularly published in both morning and evening journals, before undertaking a journey which may involve exposure to bad weather. In this season of pic-nics and similar excursions, the Signal Officer's reports, viewed only as aids to pleasure-seekers, are of great advantage. The benefits they must confer on navigators either of the sea or the lakes cannot but be regarded as inestimable. So far, we must confess that these reports have more than fulfilled the expectations of meteorologists, and will doubtless result, before many years pass, in establishing exact rules for foretelling all future atmospheric changes.—*New York Daily News*, June 26, 1871.

Usefulness Demonstrated.

It is a proof of the practical value of the reports of the Weather Signal Service published in the daily papers, that since its recent establishment, property of much greater value than the whole cost of the service has been saved by it. The warning given of the coming of a recent great storm on the lakes saved property worth over a million dollars. The officers on the lakes can now confidently predict the coming and violence of a storm from twelve to twenty-four hours in advance.—*New York University Monthly*, June, 1870.

THE American Agriculturist was one of the earliest advocates of the plan for communicating by telegraph the state of the weather at different points of the continent. We were fully satisfied of its importance to the farmers of the coun-

try. And we cannot but rejoice that the Government is now furnishing daily reports to the papers. Probably a still more efficient system will, in time, be inaugurated by the use of signal guns. But even now, those farmers who take a morning paper can receive timely warning of the approach of a storm. We believe, however, that it would be well to tell us what the "probabilities" are for two or three days in advance. Farmers have not time to study out this matter every day for themselves, and we believe they would cheerfully excuse a good many mistakes if the meteorologist would give us his opinion of what the weather is *likely* to be for two or three days in advance. We do not expect certainties, but would like to know the probabilities. And it is nearly as important for us to know that the indications are favorable for settled weather as to know that a storm is approaching. No sensible farmer will leave his hay out any longer than he can help. If it is ready, he will draw it in whether a storm is approaching or not. What he most needs to know is whether he had better cut his grass to-day or wait until to-morrow. After it is cut the meteorologist can help him but little.

We are very differently situated in this respect from the English farmer. He does not ask when he shall cut his grass, but when he shall stir it. He often cuts in a rain, thinking that by the time he is through cutting the rain may be over, and he shall have fair weather to make the hay. As long as the weather is damp or rainy the fresh cut grass will not be injured in the swath, but after it is stirred and partly cured then rain or dew is very injurious. But with us grass cures so rapidly that we cannot allow it to lie in the swath or spread out on the ground. When it is cut we must attend to it, dry it as rapidly as possible, and get it into cock. After it is in cock, it is sometimes a question with us, as it is in England, whether we had better open the cocks or let them remain as they are. It is at this point that we want to know what the weather is going to be for a few hours in advance. If, by opening the cocks, we can get the hay dry,

and there is time to draw it in, it is best to open them; but if the weather is uncertain and the hay is well cocked, it is better not to disturb it.—*American Agriculturist*, July, 1871.

Weather Predictions.

“What is the use of the weather bulletins?” is a question not unfrequently asked in these uncertain days by persons who conceive that the chief object of the Signal Service reports is to inform them when to go to market with an umbrella, or when to accept an invitation to a pic-nic or a Sunday school excursion. The *New York Times* says the real purpose of the Bureau is to explain, as accurately as possible, the progress and course of such storms as are likely to threaten vessels and impede navigation. Most of these are to be predicted both as to their extent and direction. All storms originating in large movements of the upper air, and extending over great areas, can be thus watched and pointed out a little in advance of their arrival. There are storms other than those dangerous to ships, but which cannot yet be foretold, because, though violent, they extend only over a limited area, and last but a short time.

There are also other storms not very violent, but of which it is desirable to have forewarning. They are often purely local. Concerning this class, also, the War Department does not yet undertake to give knowledge. From its last publication we infer, however, that it is progressing rapidly toward an attempt to do even this. In proportion as the officers in charge receive more minute information, and in proportion as they discover the general laws and local conditions in accordance with which their information is to be interpreted, they will be able to give us more and better prophecies. They are doing a noble and excellent work, and one by which the entire community is benefitted more than they at present realize.

The practical benefits of the Government Signal System were lately demonstrated. A terrific storm originated in the Rocky Mountains, started southward, but on reaching Corinne, Utah, turned eastward. Its course, as it varied, was reported by telegraph all over the country. The signal stations on telegraph lines are all furnished with the weather instruments heretofore alluded to, so that when the storm raged north of Corinne, and was reported at Omaha, the report was sent no further, as the instrument at that point gave no sign of its approach. The moment it turned east from Utah the barometer at Omaha told more surely than the telegraph that the storm was coming, and it was telegraphed on to the lakes, where the shipping was put in order to receive it forty-eight hours before it arrived. Thus did this admirable system save life and property by its timely warning.—*Union and American, August 11, 1871.*

Weather Reports.

The elaborate description of the Signal Bureau at Washington, and explanation of the system of weather reports and storm forecasts which we publish this morning, will be read with very general interest. No scientific service which the Government has undertaken in many years has been so universally approved or so instantly successful as the labor performed in this bureau of the War Department, by General Myer, Professor Abbe, and their assistants. It is of the greatest importance to science from many points of view; but it is in its relation to the business of everyday life, to the practical problems of the farm and the seashore, and the out of door amusements of common place gentlemen and ladies, that it has naturally attracted most of the attention of the public.

Foretelling the weather, when it was not the shrewd guessing of seamen and keen-eyed farmers, used to be a pseudo art, something like astrology or alchemy, and the almanac maker

who wrote across a whole column of his calendar "Expect — rain — about — this — time," ranked no higher in the estimation of sensible people than the gipsy who told one's fortune with a pack of cards. But we have changed all that. By the best of all tests—that of actual trial—we have proved that the path of a storm can be foretold with almost mathematical accuracy. We can watch its beginning, and by a careful study of the atmospheric phenomena at various points we can decide what course it will take, and flash the prediction by telegraph to all quarters of the country. This is the work which, with much else that is highly important to meteorology, the Signal Bureau is now doing in Washington. The value of such services to commerce and to agriculture can hardly be over estimated, and the appreciation in which they are held by the public is sufficiently evinced by the eagerness with which the daily reports are read and the confidence which they always inspire.—*N. Y. Tribune.*

Signal Bureau at Washington---Study of the Weather.

A day or two ago we published a short article on this subject, calling attention to its importance as affecting trade and navigation, and showing some of the practical benefits to be derived from this important Department of our Government.

As the subject is one of considerable interest, both to the practical and scientific man, we propose in this article to go more into details, and advert to the history of and some of the methods used by this Department. This branch of the public service has been organized but little more than a year into a separate department, but observations have been taken in the several States for the benefit of the Agricultural Bureau for many years.

Nearly two centuries and a half ago Lord Bacon made the observation that the winds generally follow the course of the sun, that is, from east to south, and rarely shifted contrary to the course of that luminary. In this he laid the foundation of the great law of atmospheric gyration, which was afterwards demonstrated by Ferrel and Dove. Great interest has been awakened in, and increased attention given to the study of meteorology by the labors of these distinguished scientists. Mr. W. C. Redfield, who, in addition to the establishment of the fact that storms have a gyratory motion, was a close student of all atmospherical phenomena, first applied the telegraph to the signaling of storms. Prof. Henry, of the Smithsonian Institute, urged upon Congress the policy of putting the suggestion of Mr. Redfield into execution, so as to have coming storms announced, and thereby be able to protect shipping from their destructive effects. He obtained a liberal appropriation, and out of this has grown the Weather Bureau.

This Signal or Weather Bureau, by a combination of telegraphic currents, takes synchronously the observations of the weather at seventy select points in the United States, and these observations are published in all the leading papers in the country. There are taken the height of the barometer and thermometer, the direction of the wind and its velocity, the relative humidity of the air and the state of the weather at each of these stations. From these data a map is constructed, and the probabilities of the weather for the next twenty-four hours are predicted. The experience during the past year shows that these conjectures, based upon immutable laws, await but the developments of time and a larger accumulation of facts to make them in all essential particulars as accurate as the foretelling of the rising and setting of the sun, the occultations of Venus, or the time of an eclipse of the sun or moon.

In order that our readers may understand the philosophy and principles upon which these conjectures are founded, we premise that in all countries during certain seasons there are

general winds, dependant upon the rotary motion of the earth, and upon uniform and fixed meteorological laws, varying with regularity as the seasons change. These are to be carefully distinguished from local winds, which result from the local pressure of the atmosphere, and are influenced by the elevation or depression of the locality, the quantity of humidity in the atmosphere, by local obstructions, and several other minor causes not necessary here to mention. Or to make the matter plainer, we are to look upon the general winds as constant forces acting regularly, while the local winds are variable and inconstant, sometimes acting in conjunction with, and sometimes in opposition to, the regular aerial currents. Now the regular winds, as modified by their local currents, will give the probable course of the wind at any given time.

To illustrate the methods used: The normal height of the barometer on the Atlantic coast is 30.00 inches. If, then, observations are taken at two points and the pressure is found to be 29.95 and 30.05, then the presumption is that midway between these points the barometer stands at 30.00. Now, by connecting all these points of equal pressure, there may be seen the narrow band over which the barometric pressure is uniform. After having drawn the normal line of 30.00 inches, similar lines may be drawn, showing the line of equal pressure when the barometer stands at 29.90, 29.80, etc. Passing to the other side of the normal line, the points where the barometer stands at 30.10, 30.20, etc., may be united, and so on for all the points of equal pressures. These lines are called isobarometric lines. Sometimes they inclose a central area, in which the pressure grows less and less to the centre. The isobarometric lines then drawn form concentric circles. Now, within areas of this character, where the atmosphere must, in accordance with known mechanical laws, be pushing from the regions of higher to those of lower pressure, occur cyclones, tornadoes and thunder storms. If, on the other hand, the centre is found to be of highest pressure, the wind, in obedience to the same law of mechanics,

will blow outwardly, or from the centre, deflected, of course, by those general laws arising from the revolution of the earth about its axis, which always turn it to the right as it moves forward. When there are no well-marked central areas, the winds, by uniting with the lines of equal pressure, indicate some area beyond the limits of observation. In the summer, for instance, the south and southeast winds indicate the low pressure that prevails in the Missouri Valley. When the pressure over a large area is uniform, then minor local influences sometimes affect the winds—such as temperature and humidity.

Now if we add to the barometrical observations the temperature of a particular place with the isothermal lines and the isobarometric lines, shown on a map, giving in one connected view the whole state of the atmosphere, with the local and general influences, any one may readily infer what will be the probable state of the weather for the ensuing twenty-four hours, especially if added to this is another element, viz.: the amount of humidity that prevails, and the kinds and changes of the clouds. These last indicate the relative temperature, moisture and pressure, existing in the upper air. The ascent of warm air makes *cumulus* clouds. They disappear when not fed by these currents. The *cirrus* clouds, which are known by their hairy, bushlike appearance and feathery form with “wisps of diverging fibre,” are always seen in the more elevated regions of the atmosphere, and their vapor is supposed to exist in snowy flakes. Now the union of these clouds, or of two layers of different kinds, always takes place when extended rain storms prevail. It will be readily seen, that from the phenomena of their formation, these clouds must differ as widely in temperature as in form, and so, when united, must be productive of excessive rains. The reason is that a warm and a cold current of air must be united before there can be set free the moisture in either. As the capacity of the atmosphere for retaining moisture diminishes more rapidly than the temperature, so when there is a union of two clouds differing in temperature, the

capacity of the whole is diminished, and the excess of moisture is set free in particles which coalesce and form rain drops.

We have thus gone somewhat into details in order to give a correct conception of the immense value to the country of these observations, and to give some idea also to the unscientific reader of how these facts are utilized. Every class in the community has a direct and personal interest in the investigation of these natural laws. The farmer may in a few years, by inspecting the observations of the Weather Bureau, tell whether it would be better to reap his wheat, plow his land, or sow his seed. Sailors will be admonished to prepare their ships for storms, or to spread their clouds of canvass to the breeze, and so skim merrily and swiftly, with swelling sails on their voyage, fearless of rising storms. And it is also more than probable that if these investigations and observations are extended through a long series of years, a moderately correct calculation may be made as to the kind of weather which will predominate through any given year. Prof. Stewart, of Montgomery county, Tennessee, by carefully noting the quantity of rain which has fallen during the past twenty years, has constructed a pluviometrical curve, which, he thinks, is beginning, after a series of years, to repeat itself. If this is true, and the equation for the curve is found, it will be an easy matter for any neighborhood, after ascertaining the curve, suitable for that particular spot, to tell the amount of rain that will fall for a certain year in that neighborhood. Let us hope that the number of observers in meteorology will be largely increased, so that its grand results may be made the sooner to minister to the wants and to conduce to the happiness of the human race, and be a source of wealth, strength and greatness to the country.—
Union and American, August 12, 1871.

The Cyclone and its Lesson.

On the 21st of August a terrific hurricane passed over the Islands of St. Thomas and St. Kitts, destroying almost every house, killing from a hundred to a hundred and fifty of the inhabitants, and rendering six thousand people homeless and destitute. During the time that the storm occupied in passing over these islands, the wind came from five directions, in the following order: The gale first broke from the east and soon shifted to north-east; at noon it was blowing from the north; in the afternoon it came from the north-west; at six o'clock it swept over the island from the south, and in the evening it had passed. These observations show that this storm, having an interior rotary motion, originated in that great manufactory of hurricanes, the Caribbean Sea, between the north coast of South America and Santo Domingo, and that it was moving in a northeasterly direction at the time it first broke upon St. Thomas. This direction was maintained until between five and six o'clock in the afternoon. It then turned to the northwest, and when last observed at St. Thomas was moving directly for the coast of Florida, distant twelve hundred miles in a direct line.

Cyclones are impelled forward by the trade-winds in which they originate. The velocity of these winds is from fifteen to twenty-five miles an hour. Supposing this cyclone to move at the average rate, twenty miles an hour, it ought to reach the coast of Florida in sixty hours after leaving St. Thomas, or, allowing one hour for difference of time, at seven o'clock on the morning of August 24th. At the time the Weather Bureau report was made at eight o'clock A. M., August 24th, the barometer was rapidly falling at the Florida stations, and the indications of great atmospheric disturbance were so great that Prof. Abbe, the meteorologist, announced the probable existence of a cyclone to the east of Florida. In a short time it reached the coast, and carried such destruction with it that the telegraphic lines were down when the time came to make the next report, and no news was

received from the Florida stations. Its course after it struck the land is well known to those who have studied the weather reports of the past ten days.

These facts are full of important suggestions as to the future possibilities of the Weather Bureau. Had the United States been connected by telegraph with St. Thomas and other West India islands, and had there been observer stations at various points from Florida to St. Thomas (both of which will be accomplished facts within the next five years,) the approach of this terrible cyclone might have been announced along our coast and in every port on our eastern seaboard *sixty hours* before its arrival. This knowledge might not have enabled merchants, planters, and railroad men to save their property from injury, though a timely warning would have caused them to prepare for the storm, and their loss would have been much less than it now is. We can as yet make no estimate of the damage to shipping along the coast of Florida by the hurricane, but that it must have been immense is evident from the fact that the Collector of the Port of Jacksonville has telegraphed to the Secretary of the Treasury at Washington for permission to feed the destitute, shipwrecked sailors who have arrived in that port in great numbers, and furnish them with transportation to Savannah. How many of them may not have been within the reach of warning signals, could they have been given during the sixty hours that the cyclone was moving from St. Thomas to the coast of Florida?—*New York Daily Tribune*, September 2, 1871.

THE PROGNOSTICATIONS of the Weather Bureau have been so accurately verified by the meteorological phenomena of the past fortnight, that there can no longer be any doubt as to their correctness and value. Two great cyclones, both of which made great havoc, were announced in advance of any

noticeable indications of atmospheric disturbance, and their routes were clearly and correctly indicated. On the 17th ult. it was telegraphed over the United States that a great storm was raging between the Bahamas and Florida coast, and that its path was from Florida northwest across the country, with easterly winds and rain. On the 19th ult. it was further announced that the centre of the cyclone would probably keep a little east of the immediate coast line, and be off Hatteras on the following morning. The storm reached Savannah on the morning of the 20th, and as it progressed it took the course and assumed all the characteristics predicted for it. The *Savannah Republican*, in its account of the effects of the storm, stated that the predictions of the Weather Bureau, by putting the people on their guard, had saved not only much property which would otherwise have been destroyed, but a great many lives as well. Another cyclone was predicted the 24th ult., and its course marked out, and the prediction was fully verified by the result. The warnings in both cases were given long enough in advance to be available for mariners, enabling them to make preparations which would not otherwise have been considered necessary. The system is not yet perfected, but when arrangements are completed for communicating the results of observations in the West Indies, where most of the great storms reaching this coast originate, much more exact and timely warnings of weather changes may be expected. The results already accomplished by the Bureau have fully indicated the wisdom of its establishment, and the service which it has rendered within the past fortnight has, doubtless, saved enough property to more than cover the expenses of its maintenance from the first.—*Oswego Daily Press*, September 8, 1871.

The Weather Reports—Their Use to Farmers, &c.

Important arrangements have recently been made for extending the benefit of the daily weather reports to farmers and agricultural societies. The law instituting the Meteorological Bureau makes it imperative on the Chief Signal Officer merely to furnish "notice of the approach and force of storms on the northern lakes and seacoast," and its intent is limited for "the benefit of commerce," just as is the similar bureau, established in 1861, in England, under the supervision of Admiral Fitzroy. Indeed, all institutions established for the purpose of gaining weather intelligence in Europe were designed to give timely premonitions and forecasts of impending or approaching gales likely to affect the shipping or sea-going community.

Like everything else, however, that is of a truly scientific origin and proceeds upon accurate observations of nature in the lofty spirit of the Baconian philosophy of induction, the enterprise of which we speak has its manifold benefits and blessings. While, directly, the Weather Bureau is operated in the interest of the imperilled mariner, it is in future, as far as its means justify, to coöperate with agricultural and horticultural societies, many of which have already solicited such coöperation from General Myer, and have expressed their high appreciation of the naked information which the Signal Office, through the press, twice every day, spreads broadcast over the whole country.

The agency of man in altering the physical conditions of any part of the globe on which he sojourns has never till now been at all understood. Few would suppose that the Valley of the Nile, through immemorial ages of the past doomed to eternal drought and sterility but for the swellings of its noble river, should, by human agency, be made to arrest the passing cloud and rob it of its moisture and fatness. Little did the pioneers of the far west dream that the felling of their forests and the drainage of their swampy prairies would, in time, so seriously reduce their mean

annual rainfall that, in some regions, at this season, they must drive their cattle hundreds of miles to water, and tarry at the water course till the equinoctial rains. Steadily, however, the climatic character of vast sections of the continent is undergoing a most serious change. At some future time we shall call attention to these grave changes, which will, by their silent and unnoticed, but yet potential, agencies, revolutionize the labor and industries of some of our States, and even, perhaps, alter the social complexion of entire portions of the country. But it is enough at present, in this connection, to point out the splendid field of usefulness which lies before our Meteorological Bureau in the investigation of these climatic phenomena, upon which every intelligent man, but especially the intelligent farmer, must anxiously fasten his attention.

It often happens that the indirect advantages which follow upon human achievements and labors exceed those that are immediate and direct. The English mechanic who first applied steam to pumping water from the coal mine might not have thought that his application would subserve the more magnificent and gigantic purpose of driving the monster steamship through the ocean. The poor French prisoner who, in 1792, first contrived a telegraphic code for conversing with those outside his prison wall probably did not conjecture that upon the discovery of the laws of electricity his device would become of world-wide and all-embracing importance. If the Signal Office had no other mission to fulfil, and should its valuable and almost invariably correct forecast cease, the sphere of usefulness left it in learning and publishing the great climatic peculiarities of our vast country for the benefit of agriculture would alone far more than pay for double its cost and labor.

The Chief Signal Officer has shown himself glad to welcome the applications of all agricultural societies for his coöperation in furnishing both timely storm warnings and in amassing the largest possible fund of exact weather statistics. Let his efforts be seconded and sustained throughout the country.—*New York Herald*.

Triumphs of Science—The Late Cyclones.

Within the last fortnight we have had two striking and brilliant triumphs of science. The fearful cyclone which developed itself fully, near Savannah, on the evening of the 20th inst., was detected and preannounced at thirty-five minutes past seven o'clock on the morning of the 17th, as then existing "between the Bahamas and Georgia." This announcement from the Office of the Chief Signal Officer took place nearly three entire days before the tropic-born monster fell upon the Georgia coast in all its fury. On the morning of the 18th, the announced path of "the cyclone in Florida" was "to the northwestward into Georgia, with easterly winds and rain," and later in the day this telegram was reaffirmed by the Signal Officer. On the 19th it was added at an early hour, by telegraph, "The centre of the cyclone will probably keep a short distance east of the immediate coast line, and be off Cape Hatteras to-morrow morning." These storm warnings, issued to all the harbors interested, between forty-eight and seventy-two hours in advance of the threatened hurricane, it seems by our latest reports, were verified with fatal punctuality. The Herald has already given in full the statement of the Savannah *Republican*, that on the 20th the weather report of the Signal Bureau had been singularly correct, and that in this instance "the correct predictions of the Bureau have saved a great many lives and an immense amount of property." The damage by the storm in Savannah was estimated at not much less than one hundred thousand dollars. The steamship *Lodona*, of New York, we already know, was the victim of its violence, and our telegraphic columns report many vessels disabled.

On the morning of the 24th a second cyclone, which has but just died away, was discovered and reported, which in forty-eight hours verified the probabilities of the Signal Office in a fierce visitation of the South Atlantic coast. As predicted, its track lay "more to the west than that of the

cyclone of the 18th instant." The telegrams from Georgia and Tennessee show that it has been a serious and severe storm. Thus, in the space of a few days, we have had the strongest evidence of the wisdom and ability of our national Storm Signal system. The wires bring us information that the West India and Panama telegraph cable has just been successfully laid to the islands of St. Lucia and Barbados. These latter are in the very centre of that region where the cyclone and hurricane are generated, and by weather telegrams from these islands daily, (which the energetic Chief of the Signal Corps will doubtless soon obtain,) we shall be advised of the approaching tempest before it has fairly started on its destructive course.—*N. Y. Herald, August 30, 1871.*

A System of International Weather Reports.

The popular interest and confidence in our Weather Bureau continues to increase. At a recent meeting of the Memphis Agricultural and Mechanical Society, a movement was set on foot for internationalizing our weather and storm signal system. The object of the movers in this enterprise, who quote the conference which met at Brussels, in 1853, (as recommending a universal and systematic plan of observations,) is to utilize weather reports from all parts of the world for agricultural purposes, and thus obtain the most accurate and useful forecasts of crops and all statistics needed by farmers and merchants.

The idea is a good one, if practicable, but not a new suggestion. The Herald some time ago pointed out how the present information daily issued from the Signal Office may be used by farmers and horticulturists; and the Chief Signal Officer issued a circular on this subject some months ago. This officer has already taken steps to unite the West India reports with ours, just as those of Canada have been united

for some time; he has also stated his purpose, as far and as fast as ocean cables are laid, to employ them for weather telegrams whenever the information they can bring will be practically useful. When the proposed Pacific cable is completed the intelligence from the Sandwich Islands will be of great value. The importance of information from all parts of the atmosphere cannot be exaggerated, if we regard the great aerial ocean as we regard the aqueous ocean, one mass, all of whose parts move together, and, although separated, united,

Distinct as the billows, yet one as the sea.

New York Herald, Oct. 5, 1871.

THE NOTION that the Government of the United States could do nothing but protect our lives and our liberties, is one that dates back a long time. What would Thomas Jefferson, its most passionate advocate, say to the spectacle of a hundred and twenty-three men employed by the War Department in watching the signs of the weather at twenty-four stations, all over the country, and causing to be published in less than a year some sixteen million copies of the inferences made from their telegraphic reports? Would he not think that the "world was governed too much," and long for the time when his own moderate attainments in science secured him an acknowledged notoriety, and when, starting from Monticello for Washington with his coachman, he needed no "synopsis of probabilities" from the War Department to assure him of days of muddy journeying? The Signal Bureau, which is a most striking instance of the capacity of the National Government for beneficent action, quite out of range of Jeffersonian ideas, is being gradually extended, and will soon embrace in its reports the rise and fall of the Western rivers—something which it is believed will result in great advantage to property owners and owners of freight along their courses.—*New York Times, November 23, 1871.*

Weatherwise.

The Storm Signal Bureau has a right to congratulate itself on its usefulness. The compliment which somebody pays to it at Washington in yesterday's despatches is all deserved. Here in New York the danger signals went up the staffs on the top of the Equitable Insurance building, by 10 A. M., of Tuesday, and the gale did not burst upon us till evening. Here were nearly eight hours while daylight lasted, during which shippers were warned not to leave port, and those who heeded the caution escaped wreck and trouble. There are now twenty signal stations along the Atlantic coast and the lakes, and at most of these the warning was displayed from five to fifteen hours ahead of the tempest. The Storm Signal system is new, though it works as well as if it were old, and the people have not become used to it. But once let it be realized that the tremendous blow on Tuesday night was known to be approaching nearly half a day in advance, and the eyes of sailors in this harbor will be turned more often and confidently to the towering roof of the Equitable building to see what omens are there hung out. This Bureau is a thoroughly good thing, and should not be pinched by mean appropriations.—*Journal of Commerce*, November 18, 1871.

THE STORM SIGNALS are working admirably, but a large number of people are unable to interpret their meaning. Would it not be well for the Government to have a standing advertisement in some of the principal papers, explaining the meaning of different signals? It would not take long for our intelligent people to become as familiar with these storm signals as they are with their A, B, C's.—*New York Herald*, November 18, 1871.

The Cautionary Signals.

The success of the system of Storm Signals adopted by the Government has been gratifying beyond expectation. Under the energetic and able management of General Myer, the Chief Signal Officer, and his assistants, the present system is rapidly expanding and improving. To show of what great value it can be made, it may be stated, that yesterday morning the Cautionary Signals were flying in the city, although to the ordinary observer every sign was favorable for pleasant weather. The day was clear and beautiful, and the sky was almost cloudless. See the contrast to-day in the leaden skies, drizzling rain and snow, and generally unforeboding state of things. Whoever watches these signals may lay plans for the next day with some degree of confidence. It is claimed that sixty-nine per cent. of the published probabilities have been verified.—*Buffalo Commercial Advertiser*, Dec. 4, 1871.

BOARD OF TRADE ROOMS,
Oswego, N. Y., March 22, 1871.

Gen. A. J. MYER,
Chief Signal Officer, U. S. A.,
Washington, D. C.

SIR: Our attention has just been called by the President of our Board to the fact that, owing to the inadvertence of the Secretary of the Board of Trade, your letter addressed to the Board is as yet unacknowledged, and the action of the Board with reference thereto not yet made known.

We beg leave *now* to acknowledge the due receipt of your valuable communication, and to apologize for the delay which has occurred. With reference to your communication, the following proceedings were had:

At a meeting held October 6th, 1870, J. K. Post, Esq., President, in the chair, a communication from Gen. Myer,

Chief Signal Officer, U. S. A., was read, advising the Board, Oswego had been selected as one of the stations, and soliciting the coöperation of the Board.

The Board immediately, by a resolution, empowered the chair to appoint a committee who should take charge of the subject and correspond thereon with the Chief Signal Officer, should occasion require.

The chair appointed J. L. McWhorter, A. H. Failing and W. J. Malcolm, such committee.

Supposing that you had been advised of the action of the Board, and having when appointed but little knowledge of the subject, the committee did not propose to enter into any correspondence until after the opening of the lakes, and some experience in the working of the system had been had. But as the matter now stands, the committee beg leave to state that the establishment of the Signal Station at Oswego, and the results of the observations have, of course, been officially reported to you by Observer Sergeant Hough.

The committee take great pleasure in commending the official action, as far as within their knowledge, of Sergeant Hough, and doubt not that he will prove a valuable officer to the department. His duties are quite arduous, and he discharges them promptly, and efficiently.

The reports, we presume, are regularly received, and up to March 4, made to our Board, and posted in its rooms. The general public, as well as our members, take great interest in them.

Since March 4, no reports have been posted, owing, we suppose, to difficulties with the telegraph company.

After the season of navigation commences, we doubt not the observations will have great value to all parties interested in lake commerce.

The report *now*, as heretofore, posted in our rooms, is the report taken at 7.30 A. M., *only*. If we could have the reports for the 24 hours preceding, or a resumé of them, we think they would be of much more importance to navi-

gating interests. A single report gives no basis upon which to form an opinion as to coming weather.

We also think it would be a great improvement if each station was provided with self-registering thermometers, so that the minimum and maximum of heat for each 24 hours could be reported, and also the general direction and force of wind, and the gross rain and snow fall.

If these results, and also a memorandum of what weather, (based on the observations for the preceding 24 hours) might be expected the next 12 or 24 hours, could be posted at noon each day in our rooms, we think a great favor and benefit would be conferred on the commercial public, and one which would be very generally appreciated.

Very respectfully,

Your obedient servant,

JNO. L. McWHORTER,

Chairman of Committee.

NEW YORK, 22d May, 1871.

Bvt. Brig. Gen. ALBERT J. MYER,
Chief Signal Officer, U. S. A.

DEAR SIR: Your esteemed communication, addressed on the 20th, through the Chamber of Commerce, to Messrs. Charles G. Curtis, J. D. Jones, M. Maury, and George W. Dow, has been handed to me for a reply.

Our committee is constituted, as at first, George W. Dow, Mathew Maury, and John D. Jones—each member having been reëlected at the last meeting of the Chamber, to serve another year.

We are highly pleased with the progress your Department has thus far made in the meteorological investigations and publications. Our citizens look constantly for your reports, with great interest and favor, and frequently express themselves as much surprised by the general accuracy of your foretelling “probabilities.”

It is gratifying to know that you have finally made satisfactory arrangements with the telegraphic companies, and can now work with greatly increased facilities, and we shall gladly aid you all in our power.

Most respectfully yours,

GEORGE W. DOW,

Chairman of Committee N. Y. Chamber of Commerce.

NORTH CAROLINA.

Old Probability.

The probability man at the Storm Signal Bureau, at Washington, is growing in favor with the people, and fairly earned their respect and confidence by the singular accuracy of his weather predictions. It is but simple justice to him to say that he has predicted the weather during the time he noted, and prophesied the predictions with marvelous exactness.

The *Columbus Dispatch* says: "Some of our people in Ohio lately used 'cuss words' against him for not giving them a dose of rain storm, when their springs and streams were drying up and their fields bleaching in the scorching sun; and when, last Friday, Old Probability announced that rain storms might be expected in Central Ohio, the farmers watched and scrutinized his predictions.

"His prophecies were realized, and the farmers were convinced that Old Probability was a better weather prophet than any tin rooster stuck on the gable end of a barn. The wind veered as he predicted, the rain fell as he foretold; and cooled by the one and washed by the other, the fields

began to resume their natural green, and the springs to overflow with their usual weight of water.

“The reputation of Old Probability has been established by this last meteorological feat, and old farmers wait in town some hours after their usual time to ascertain from the evening papers the probabilities of the morrow’s weather.

“The crude notion that Old Probability was, in some measure, responsible for the state of the weather, has been abandoned for the more rational belief that he is a first-class bovine with a glass eye, a calico eyebrow, and gutta percha ears.”—*Wilmington Morning Star*, September 2, 1871.

OHIO.

THE storm reached Lake Michigan on Tuesday, as predicted. Heavy rains were reported at Milwaukee and over the northwest. At Madison, Wisconsin, there was a severe hailstorm, some hailstones being as large as marbles. The storm reached here on Tuesday night, showing the trustworthiness and value of the storm prognostications by the Weather Signal Corps.—*Cleveland Leader*, March 15, 1871.

WHEN the present system of weather observations shall have become fully established, it is proposed to locate signal posts along the lakes and the Atlantic coast, whereby the movements of such storms and other threatening changes in the weather shall be notified to passing vessels; and

these are expected to hoist similar signals, so as to notify other vessels, so that all who come within the range of the system may be informed in due season of the perils ahead, and make their preparations, or run into harbor, accordingly. This will, perhaps, be the highest use of the signal service; but if it be continued in full force, as it should be, there are scores of ways in which its observations and reports can be turned to the interest, the convenience, and even the safety of the public, whose servant it is.—*Cleveland Herald*, April 18, 1871.

The Weather Reports.

The readers of the Commercial have, doubtless, observed the weather reports which appear in its columns each morning, and been surprised at the accuracy with which the character of the weather each day is given on the preceding morning. The observations are taken at thirty-five different points at present, but before the season is out it is expected that about seventy-five reports will be received. The whole system is yet new and imperfect, but enough has been developed to demonstrate its importance and leave no doubt of the success of the gentlemen engaged in this work, who are confident of their ability in a short time to reduce this "weather prophecy" to a regular science. Any one can readily see the importance of this work by reflecting upon the advantages which would arise to all classes of people from a knowledge in the morning of the character of the weather during the day. Our reports at present are very valuable, and they will continue to be more so as the system is extended and improved. We have no doubt but the time is near when every man may know each morning the general state of the weather for the next succeeding twenty-four hours.

We see it stated that the Weather Signal Service Office at

Washington is sparing no pains to increase the correctness and value of its observations. It has just received a complete set of self-registering meteorological instruments, such as are used in the Kew Observatory, near London. Several of these instruments, including the barometer and thermometer, register themselves by means of photography. The anemometer is believed to be the only self-registering one in this country. These instruments will be employed in making observations in Washington, and the results will be carefully compared with those obtained by the instruments hitherto in use. It is gratifying to know that those having charge of this important service are exercising so much energy and skill in developing its practicability.—*Toledo Commercial*, April 27, 1871.

The Weather Reports.

Our readers will be glad to learn that the difficulty between the Meteorological Bureau at Washington, and the Western Union Telegraph Company has been finally adjusted, and that from the 24th of the present month the full reports and predictions will be sent twice a day as formerly. The Government has established new stations at Marquette and Escanaba, the reports from which will be of great interest to sailors, shippers and vessel-owners on the lakes.

Although but a few months have elapsed since this system of weather reports was inaugurated, their immense practical value is now everywhere conceded. Even amid the fitful, erratic weather of April and May the predictions of the Chief of the Weather Bureau have been in almost every instance verified with a closeness and accuracy which has seemed wonderful. But a few days ago the operator predicted a storm in California, and the despatch had hardly reached San Francisco from Washington before there burst upon the Pacific Coast one of the most severe and general

rain storms ever known there at this season. As midsummer draws on, and the hay and harvest season commences, these reports will be of extraordinary value to the farmers, and we commend to them a careful study of the predictions which they will find each morning in the Leader.—*Cleveland Daily Leader*, May 19, 1871.

Weather Reports.

The United States Signal Department has placed in the Board of Trade Rooms a weather chart, showing the Meteorological Stations recently established throughout the country. The telegraphic reports of observations taken synchronously at these stations at 7.16, A. M. (Cleveland time,) will be placed upon this map as soon as received, the weather at each station being indicated by appropriate symbols and figures readily understood, and by which the location and progress of storms can be observed at a glance. Masters of vessels especially are invited to avail themselves of the facilities offered at the Board of Trade and at the Signal Office, for obtaining information that cannot fail to be of great interest and benefit to navigation. Free admission to the rooms of the Board of Trade is allowed to all shipmasters in active service.—*Daily Herald, Cleveland*, June 10, 1871.

The Weather Prognostications.

Considering the general incredulity that existed on the subject of weather prognostications based on “signs”—an incredulity justified in great measure by the proverbial fact that “all signs fail in a dry time,” and were frequently fallacious at other times—the reception by the press of the daily weather bulletins of the Meteorological Department at Washington was more favorable from the first than might

have been expected. There was a manifest disposition to give the matter a fair trial, and this disposition was undoubtedly strengthened by European experience in the way of meteorological observations. Here and there a newspaper occasionally pokes fun at an apparent failure on the part of the elements to fulfil the promised programme of the officer of the weather, but in most cases these gibes prove to have been unmerited. As a general thing, however, the testimony has been strongly in favor of the correctness and value of the weather observations and the prognostications based upon them. We have taken pains to watch these prognostications from the first, and to compare them with the facts. So far, we cannot recall an instance of notable failure. Ample warning has been given of every considerable storm, and no such warning has proved a false alarm. Even the minor shades of weather, probable direction of wind, and general temperature as affected by winds, have been foreshadowed with reasonable accuracy.

Those facts have gradually forced themselves on the attention of the public, and many of our readers turn to the Weather Bulletin every day as among the first items of news to be read. We know of families who are guided by it to a great extent in their domestic and social arrangements, judging whether it will be a good "drying day," and whether it is safe to take pleasure jaunts or visit evening places of amusement without providing against coming storms. The Buffalo *Express* narrates a conversation with a farmer of that neighborhood, giving the results of his experience, and his testimony could undoubtedly be paralleled by the experience of many persons in this locality. The *Express* says:

"Until the experience of this gentleman was related to us, we had not, ourselves, half appreciated the usefulness that these daily premonitory signals possess for any one whose business is particularly dependant upon or much influenced by the state of the weather—such as the farmer, the builder, and all pretty nearly in fact, whose work, as we phrase it, is 'out of doors.' He tells us that, since the pub-

lication of the weather reports first began, he has given careful attention to them; that he has thoroughly tested the almost unfailing correctness of the forecasts of weather which is deduced from them, and that now he is governed by their prophetic dictation entirely in planning his farm work and laying out his undertakings, so far as the weather has to do with them. He consults the weather despatches as an oracle, every morning at the first opening of his paper, and unhesitatingly takes from it his cue for the next twenty-four or forty-eight hours. He says that he is never misled, and that what he saves and gains in the management of his business, by foreknowing with approximate accuracy the changes of the weather and the coming of storms, is worth to him a great many times the cost of the newspaper which furnishes it."

Every month adds to the extent and efficiency of the observations and consequent accuracy of the prognostications. It will probably not be very long before the divisions of territory for which the special "probabilities" are prepared will be greatly subdivided, so that, if necessary, predictions can be made for small sections three or four times a day.—*Cleveland Herald*, July 30, 1871.

Weather Science.

Observers who noticed the red flag flying over Atwater Buildings on Tuesday morning, and wondered what it was all about, must have very generally concluded on the evening of that day, as the gale burst upon the lake and city, that there is something more than a mere guess in the Government "weather probabilities." Most of the lake captains heeded the warning and remained in port, but one ventured out and lost his vessel in consequence. How far the new

cautionary signal system is responsible for the fact that the recent severe storm was attended with so few disasters on Lake Erie, it would be difficult to say, but beyond question its services have been most important. At all events it was one of the most sudden and severe storms that has been known for years, and the disasters thus far reported are remarkably light. We shall look with confidence to see the marine losses on the lakes less next year than ever before since western navigation attained anything like its present proportions. The whole science of meteorological observation and prediction is rapidly approaching a wonderful degree of accuracy, and promises early and very valuable results. In this connection it is interesting to notice that Commodore Maury, to whom the Storm Signal System is indebted for many valuable suggestions and discoveries, has just read before a Maryland society a paper proposing a grand enlargement of the storm signal system, so as to include all civilized countries within its scope. Besides weather reports, the observers of the proposed system would be required to report regularly the amount of rain, the character of the seasons and minute accounts of the condition and promise of all important crops. It is well known that at present speculators are enabled in many cases to seriously disturb the markets by getting up false alarms over the failure of certain crops in distant localities, and it is rightly judged by Professor Maury that his proposed plan would effectually prevent all this in future.

The merchants of New York and London could at any hour command facilities for ascertaining just how sugar was growing in Brazil, coffee in the Indies, or wheat on the steepes of Asia Minor, and the world of commerce would thereby be enabled to anticipate and provide for any scarcity, in a remote section, resulting from a failure of the local crop. It would in short be a most important step toward that thorough and immediate intercourse between all nations which the present age is beginning to demand.

England, France, Germany and the United States have

each their separate Storm Signal Bureau! They have but to join in the project of an international exchange of reports and Professor Maury's plan will be in a fair way toward completion as soon as the ocean telegraphs now projected are laid to the distant colonies belonging to those powers.—*Cleveland Herald*, Dec. 1871.

Storm Signals on the Lakes.

The thorough success of the Storm Signal Bureau so far as its application has been attempted, is well understood. Thus far, however, its results have been more valuable to those on shore than to the mariners afloat on the seas and our great lakes, and this for the reason that no adequate means have yet been devised for communicating the meteorological facts known on shore to those at sea. To meet this difficulty it is suggested that the Government adopt a system of shore signals similar to those which have been in use with such favorable results in England. It is well known that a vessel sailing from the middle of Lake Erie into the port of Cleveland often undergoes a marked change in meteorological surroundings. While it is calm or favorable sailing weather fifteen miles from land, a high wind may be prevailing on shore, with a threatening storm, and the vessels may sail out of comparative safety into the serious peril of attempting to make our narrow harbor in a gale. Again, a vessel passing here bound up the lakes may sail past under a bright sky, while the storm signal operator in this city knows that she will encounter a furious storm before she can possibly reach Detroit River. To meet all this varying class of difficulties it is suggested that there be erected at all prominent points along the lakes, a series of shore signals arranged after the English plan. These consist simply of a tall staff upon which can be hoisted by day a canvas banner shaped to convey a certain meaning. In

the British system a cone shaped flag is raised, with the apex pointing upward to indicate that a gale may be expected from the north, if downward, from the south. A cylindrical form shows that the wind may come from any quarter and the cone and cylinder together indicate that a gale is certainly imminent. At night, lanterns are used, and these signals, seen at a distance of from ten to twenty miles, have saved hundreds of lives, and property to a large amount. When it is remembered that in 1869 the marine losses on the western lakes alone amounted to a million and a half of dollars, it will not seem strange that a system which would cost but a tithe of that amount should be so strongly urged for immediate adoption by those most interested and best qualified to judge of its merits.—*Cleveland Leader*, June 26, 1871.

PENNSYLVANIA.

THERE is a difference of opinion in the Appropriation Committee on the propriety of continuing the Storm Signal Service. This new system has just been got into fair working order, is now being practically tested by every branch of the community, and certainly bids fair to prove beneficial to the agricultural, marine and scientific interests of the country. The Committee on Appropriations cannot well devote money to a better or more popular service than the Storm Signal Corps.—*Philadelphia Enquirer*, January 27, 1871.

FORECASTS of the weather for twenty-four hours, based on the reports of the Signal Service, will hereafter be furnished by the Government. These will be of great service to those who journey, or have ventures by sea or land. If the snow storm of yesterday had been announced a day in advance, thousands would have made preparations to meet it in a proper manner, and thus escaped both loss and discomfort. Wind storms may also be forecast with great advantage to shipmasters and those who journey by water. If a skipper has intimation that a storm may be expected at a certain time, he has the choice of remaining in a secure place, or running out to sea, and avoiding the danger of being dashed upon the coast, amid winds, waves, and tempest gusts. The contemplated movement is one of practical value, and it will be so regarded by the public.—*The Age, Philadelphia, February 15, 1871.*

The Weather Reports.

It used to be quite a common thing to refer in a jocular way to the "Clerk of the Weather," as a person to be consulted in order to learn whether it was "likely to be a fair day to-morrow." That Clerk was a myth. It has remained for our day to bring forth a veritable Clerk of the Weather, who is "a live man," who attends to his business, who speaks with no uncertain voice, and who rarely disappoints. He is a vigilant and far-seeing functionary, for he keeps watch over the air, the winds, the clouds, the rains, and the storms, from the Atlantic to the Pacific, and from the great lakes to the Gulf of Mexico. He has forty subordinate "Clerks," who keep watch under him in the large cities, and at various favorable positions throughout the United States. One of these has his office in Philadelphia, but the Central Office is in a quiet side street near the War Department in Washington. This latter is the Headquarters of the

Chief of the Signal Corps of the Army. There he is surrounded by a small staff of assistants, and in communication with the whole telegraphic system of the country, and surrounded also with instruments so delicate, and yet so nearly perfect that they feel and instantly record the slightest change in the atmosphere; with maps, and symbols by which these changes can be promptly shown upon the maps, so that the condition of the weather everywhere in the United States is shown at one glance, and the direction in which either a storm or fair weather is moving is perfectly visible. The work of this Office is still in its infancy, and yet it is already far in advance of any meteorological system heretofore established in any country.

There are at this time about forty observing stations, but the number is to be considerably increased. The one farthest east is Portland; the farthest west is at San Francisco; and the farthest south New Orleans. The others are, of course, intermediate. The most westerly station, however, in which we of the Atlantic coast have direct interest is at Cheyenne, at the eastern basis of the Rocky Mountains, for the storms of the "Great Basin" and the Pacific slope but rarely affect this part of our broad country. At each of these stations is a "sergeant observer," who is enlisted in the army, and carefully instructed, and who is furnished with approved standard instruments, and a clear and full code of instructions, including a "cypher" for brief, uniform, and inexpensive telegraphing. Each of these "observers" makes three observations and three telegraphic reports per day to the central office, as nearly as possible eight hours apart. These reports note the present condition and the changes of the barometer, of the temperature as indicated by the dry and wet bulb thermometers, of the direction and force of the wind, of the appearance of the sky, and also as to the presence or absence of rain, snow, hail, sleet, fog, &c. All the observers being in telegraphic communication with the central office, the observations are made at the same instant of time over the whole country; they are made by instru-

ments adjusted to the same common standard; they are made by men trained under the same code of instructions; they are reported in the same forms of language; and are, in consequence, as near absolute uniformity as they can be. These characteristics give them their great advantage over the systems of other countries, and their great value in this.

Thus far the reports have wisely abstained from predictions except in the form of "probabilities," and these are limited to about twelve hours in the future. But higher and more important uses of the system are yet to come. It is already known that the severe northeast storms of the north Atlantic coast move from the west towards the east or northeast. There is scarcely a known exception to this rule. The path of one of these storms, beginning west of the Missouri river, or in the same longitude, can be foreseen with reasonable accuracy as to the belt of country it will cover, and the time when it will reach any point to the eastward. When the system of observation shall have become fully established, it is proposed to locate signal posts along the lakes and the Atlantic coast, whereby the movements of such storms and other threatening changes in the weather shall be notified to passing vessels; and these are expected to hoist similar signals, so as to notify other vessels, so that all who come within the range of the system may be informed in due season of the perils ahead, and make their preparations, or run into harbor, accordingly. This will, perhaps, be the highest use of the Signal Service; but if it be continued in full force, as it should be, there are scores of ways in which its observations and reports can be turned to the interest, the convenience, and even the safety of the public, whose servant it is.—*Philadelphia Public Ledger*, April 14, 1871.

Weather Reports.

The present system of weather reports gives great satisfaction to the country, and is of much value to various classes of citizens.

We are confident, however, that several improvements can be made, without burdening either the officers of the Signal Service or the newspaper columns.

For example, the "probabilities" are now given for such large sections of country that they may fail to give true information at particular points.

It would be well, in our judgment, to be more specific in predicting for smaller sections, especially on the seaboard.

Again, the "probability" is given only for 24 hours in advance; but we think the data would usually enable the officer in charge to predict for 48 hours.

With regard to the shorter, and more certain predictions, we trust that an efficient system of signals will be devised to be displayed at lighthouses, for the warning of coasting vessels.

For all these purposes, the number of stations ought also to be increased.

We have taken the more interest in this subject, because we had the honor to be the first newspaper (with the exception of the *Boston Courier*,) to propose the use of the telegraph for this purpose.

In our issue of April 8, 1848, twenty-three years ago, we said that such "daily bulletins of the coming state of the weather" would "save more property from shipwreck than ten times the cost of the system," besides the saving of lives.

On January 13, 1849, we referred to the article in the *Boston Courier*, (which, by the way, was written by ourselves before the *Item* was born,) and, after describing the system, said, that the time was coming when "seamen will look to telegraphic bulletins of coming weather with as much certainty as they look to the Nautical Almanac for eclipses," &c.

We returned to the subject on the 17th of March, 1849, and

ask: "At how early a period in the progress of a storm is its course and velocity developed? and, if we had twice or three times a day telegraphic despatches of the weather, might we not, even with our present knowledge of meteorology, predict the weather on the Atlantic coast, and on the lakes?"—*Philadelphia City Item*, May 3, 1871.

Weather Reports.

We should be sorry to have some recent remarks of ours upon this topic interpreted as implying any censure or fault finding. The U. S. Signal Service conducts the reports with much ability, but they have not at present sufficient facilities granted them in their work. There ought to be more stations of observation, in order that the precise limits and rate of motion of a storm may be more equally defined. The observations at each station should be of two kinds—one set being taken at fixed hours of local time for giving means at each place; the second set—of winds, barometer, and weather, at least—being taken synchronously at fixed hours of Washington meantime; without this synchronism the observations are not fully suitable for tracing the paths of storms; and with it, they are not so valuable for establishing and comparing means. The synchronous observations, from a *large number of points*, will enable us finally to classify storms as to their origin, and to determine, perhaps, the conditions which sometimes lead the weather to run in cycles six and a half to seven days, for a month, and even sometimes two months. We also need telegraphic communication with the principal light-houses and headlands, that we may display weather-signals for the benefit of passing vessels. All this will come, and come quietly—just as through the railroad and telegraph the whole system of time-keeping has changed. The observatory at Cambridge gives time by telegraph to nearly all New England; that at Albany, to

nearly all the State of New York, and so on. And General Myer, with his web of wires, is weather-wise for all the lakes and the Atlantic seaboard.—*City Item, Philadelphia, June 2, 1871.*

OFFICE OF THE BOARD OF TRADE,
Philadelphia, January 6, 1872.

Lieut. Col. GARRICK MALLERY,
Acting Signal Officer, and Assistant,
War Department, Washington, D. C.

SIR: I have the honor to acknowledge receipt of your communication of the 2d instant, and to advise you that at a meeting of the Committee on Commerce to-day, the suggestions contained therein were heartily approved, and I have been requested to assure you that it will afford the Committee pleasure to coöperate with the Department in the manner indicated.

Apropos, I inclose communication signed A. Watson, which been referred to the Committee, who hold in abeyance their views on the subject, until favored with your opinion thereon, which is respectfully invited.

I would be pleased to receive reply, (returning the enclosed,) in time for report of the Committee to the Board of Trade on the 15th instant.

Yours very respectfully,

THOMAS C. HAND,
Chairman Sub Committee, &c.

RHODE ISLAND.

THE daily weather reports of the Signal Bureau have become of much interest, and to commerce and navigation highly valuable. The general accuracy of their predictions attests the value of meteorological observations, and people have learned to look to the predictions modestly styled "probabilities" for the regulation of their out-door concerns, so far as they are affected by the weather. The science of meteorology is in its infancy; but the observations, extending over so wide a surface, and the deductions made from them, are heaping up the material from which the laws that govern the winds and the storms and the variations of the temperature will yet be predicted, if not with the certainty of astronomical calculations, yet with sufficient accuracy to be of immense value in the practical business of life. It is a pleasant thing to see the scientific acquirements and the resources of those branches of the public service dedicated to war, ministering to the needs of peaceful commerce, and to the diffusion of useful information. Two naval expeditions have lately been exploring the great isthmus, the one at Darien, the other at Tehuantepec, to solve the problem of inter-oceanic communication, at some point of that narrow and mountainous strip that separates the surging Atlantic from the peaceful waters of the western coast. The army is constantly occupied in interior explorations, and the reports laid before Congress and the country from the officers in command of them have furnished much of our information upon the geography and natural resources of the vast regions which it is reserved for future generations to cover with a free and prosperous population.—*Providence Journal*, June 13, 1871.

SOUTH CAROLINA.

Weather Signals—A New Duty for Soldiers.

General Albert J. Myer, Chief Signal Officer of the United States Army, in his report to the Secretary of War for the year 1870, gives the outline of the system of meteorological observations and reports adopted by the Signal Bureau "for the benefit of commerce," as provided for in the joint resolution of Congress, passed February 9, 1870. The resolution is in these words:

"Be it resolved by the Senate and House of Representatives of the United States of America in Congress Assembled, That the Secretary of War be, and he is hereby, authorized and required to provide for taking meteorological observations at the military stations in the interior of the continent, and at other points in the States and Territories of the United States, and for giving notice on the northern lakes and on the seacoast by magnetic telegraph and marine signals of the approach and force of storms."

Nearly all the large cities in the United States and all the military posts in the Territories have been designated as stations for the taking of observations. Certain cities are designated as distributing centres, to which all the reports are sent, and from there telegraphed over the country. At each station there is to be a bulletin board giving the state of the weather in all sections of the Union at a given hour. The bulletins are also to be published in the daily newspapers, and in the course of time will, no doubt, form an indispensable paragraph in the commercial columns.

The Baltimore merchant, for instance, who has wool, or pork, or salt, or any other article of commerce which may

be effected by wind or rain, heat or cold, lying on the wharves at Chicago, or crossing the prairies in open cars, will naturally feel some interest in the state of the weather at those particular points. If, perchance, he has a vessel on Lake Erie, he will be exceedingly anxious to know the direction and force of the wind at Cleveland or Buffalo. If he has a cotton plantation in the South, frosts, rains and floods become to him as much a matter of tender solicitude as the ruling prices of the staple product.

And even to those who are not merchants, and have no pecuniary investments in which profit and loss depend on the winds and the temperature, it will afford some satisfaction to know the particular kind of day a loved one traveling in the West may have chosen for a trip by land or water. If the day be fine it will give some joy to think over his or her probable happiness. If it be cold or wet, or gloomy, there will be a sort of melancholy satisfaction in sympathizing with him or her in their discomforts.—*Charleston Republican*, Jan. 7, 1871.

THE experiment of collecting by telegraph barometrical and thermometrical reports from all important points in the United States, at the Signal Office of the War Department, at Washington, and by a scientific deduction from such collated reports, making accurate and reliable predictions of the weather in time to be of practical service to the country, is being fairly tried. The storm centre is defined, and atmospheric changes are carefully noted, and then the scientific watchers at the National Capital send their daily despatches over the wires, predicting at least twenty-four hours in advance, the prevailing direction and force of the winds, and the character of the weather in the different sections of the Union. On Saturday last, 25th ult., at 4.35, P. M., they announced among the probabilities, "thick winds on Sunday night" along the Atlantic coast. On the afternoon and

night of Sunday, this “probability” was realized as a certainty, by the dwellers in the coast and middle counties of South Carolina. How far the gust or succession of “thick winds” extended, cannot here be exactly stated. But there are at least three points in the route of the storm line which can be reliably reported. The storm, passing almost parallel with the coast, reached the vicinity of Ridgeville, on the South Carolina railroad, where it prostrated trees and fencing, and occasioned the smashing of Dr. Murray’s carriage, injuring himself and others of his family, and killing one of his children. Crossing the Santee, it came upon the Methodist congregation who had been attending quarterly meeting at a church three miles below Summerton, and were wending their homeward way in their carriages. At this point, it was equally severe, the largest trees being prostrated by the blast, and several imminent and almost miraculous escapes occurred, the horses being reined up just in time to allow the monster falling tree to reach the ground in advance of them. Thence it came on to this town, where, towards the close of a balmy day, it broke upon the scene with all the characteristics of a tempest, the rain not falling, but flying with the wind in lines almost parallel with the surface, and making what might be very appropriately designated “thick winds.” The storm, which, before reaching Sumter, was from south to north, as its general course, had here fairly commenced its circular whirl, and was from southwest to northeast. No serious damage is reported in this vicinity. The Washington office publishes its bulletins, but can only ascertain how far its predictions are verified by subsequent reports of the actual state of the elements at the times and places predicted. And in this point of view, the foregoing may not be without interest.—*The Courier, Charleston, March 6, 1871.*

A Commercial Convenience.

The United States Signal Department has placed in the rooms of the Chamber of Commerce a weather bulletin, giving telegraphic reports of observations at the various meteorological stations recently established throughout the country. The observations are taken simultaneously at these stations at 7.47 A. M., Charleston time, and will be placed upon the bulletin the morning of the same day as soon as received. The attention of masters of vessels and others is invited to the facilities thus offered, which may be availed of either at the rooms of the Chamber, or at the Signal Office, for obtaining information that cannot fail to be of great interest and benefit to navigation. It is believed that at an early day the rooms of the Chamber of Commerce will be furnished by the Signal Department with a weather chart, which will exhibit in a more compendious manner than the bulletin the state of the weather at the various meteorological stations.—*Charleston News*, June 21, 1871.

The Weather Prophets.

Early last week the Storm Signal Bureau reported that “everything was favorable in Illinois for the occurrence of a tornado.” No tornado occurring, the papers of that State made merry at the expense of the Department, and suggested that they read up on Josh Billings’ “Prognostix.” Their laughter was a little too soon, however, for on Friday evening the tornado arrived, accompanied with an abundance of lightning and a small ocean of water. Chicago invested in the sport to the amount of \$35,000, and the damage throughout the State must have been proportionally large. The Weather Bureau knows a thing or two, after all.—*Charleston Courier*, July 1, 1871.

Weather Charts in the Chamber of Commerce.

We have on more than one occasion called attention to the rapidly increasing value of the meteorological information supplied by the Signal Bureau at Washington to the different stations throughout the country. Experience proves that the Officers of the Bureau are remarkably correct in their calculations of the probable course of the weather, and it must be of great value to the shipping-masters to know the state of the weather on the coast, the direction of the wind, and, in general, when to look out for squalls. Nor can the farmer and planter afford to overlook the weather telegrams as published in the daily prints. These reports are made up to 4.37 P. M., on the day preceding the day of their publication. They are, of course, sixteen hours old when they appear in print. This cannot well be avoided, but ship-masters may, through the courtesy of the Chamber of Commerce, obtain much later information. A report similar to that published by the papers is posted up in the rooms of the Chamber of Commerce at ten o'clock each morning. This report is dated 7.47 A. M., and is posted up, as stated, within three hours from the time when the report is completed. The Chamber of Commerce courteously allow ship-masters free access to their rooms, where may also be seen the new weather chart recently furnished to the Chamber by the Signal Bureau. This chart, which is corrected at ten o'clock each morning, shows the direction of the wind and its velocity, the state of the weather, and the height of the the barometer and thermometer at all of the fifty-two stations of the Signal Bureau. These stations extend from Quebec to Key West, thence to Galveston, San Francisco, and Cheyenne, and round by Duluth to Montreal and Toronto. They cover every important meteorological point in the United States and Canada. Colored markers on the chart show, at a glance, the condition of things meteorological. A red disk means clear weather; a blue disk cloudy weather; a black disk means rain. Small arrows point out the way the wind

is blowing. Slips of card give the velocity, and the height of the barometer and thermometer. It is a very complete chart, and should be invaluable to ship-masters and all who go down to sea. As the meteorological reports are extended they will be more and more used, and the rising generation of Charleston may expect to see the time when not even a trip to the fishing banks will be undertaken until a glance has been had at the weather chart.—*Charleston News, July 28, 1871.*

CAPTAIN DAWSON, from the Meteorological Committee, submitted the following report to the Chamber of Commerce of this city, which, on motion, was adopted:

CHARLESTON, *July 28, 1871.*

The Meteorological Committee beg leave to report that they have been in correspondence with General A. J. Myer, the Chief Signal Officer, who, as requested, has furnished for the use of the Chamber, one of the valuable weather charts prepared by his Bureau. This chart is hung in the reading room of the Chamber, and is corrected by the Observer Sergeant at 10 o'clock each morning.

The weather reports, dated at 4.47 P. M., are now published regularly in the city morning papers. But the 1 A. M. reports, as we are advised, arrive too late for publication. The 7.47 A. M. report is posted on the bulletin board in the reading rooms of the Chamber at an early hour each morning, and we trust that ship-masters will avail themselves of the opportunity now afforded them of acquainting themselves with the state of the weather at the fifty-two posts of the Meteorological Bureau. This information is admitted on all sides to be of great value, and we are pleased to believe that, in the matter of meteorological reports, Charleston is, for all practical purposes, upon an equal footing with the most favored ports on the North Atlantic coast.

All of which is respectfully submitted.

Charleston Daily Republican, July 29, 1871.

“The Clerk of the Weather.”

This hitherto mythical personage bids fair ere long to assume a practical and certainly a very beneficent kind of existence. Our readers will have noticed daily in our columns, of late, a carefully prepared statement of the weather of the previous twenty-four hours, from all parts of the United States, and a “forecast” of the probable weather of the ensuing twelve hours, prepared and sent to us, each night, by the Storm and Signal Service Branch of the United States War Department, at Washington. The publication of these reports marks a new era in physical science, and opens to our view an unexplored and singularly interesting field of human knowledge. This Storm and Signal Service, by giving notice of approaching storms, has already saved thousands of dollars in shipping and cargoes on the great lakes, and after a little more preparation and organization it will become of incalculable benefit to farmers, by giving them notice, by means of cannon-firing at all the towns in the land, of the approach of storms likely to injure newly cut crops.—*Charleston Daily News.*

CHAMBER OF COMMERCE,
Charleston, S. C., May 31st, 1871.

Gen. ALBERT J. MYER,
 Chief Signal Officer, U. S. A.,
 Washington, D. C.

SIR: The Committee of this Chamber on “Meteorological Observations” are obliged for your letter of 20th inst., and have only to repeat their assurance that any assistance in their power to render, either to the agent of the United States Government or to your Department, shall be cheerfully given.

They are pleased to notice that proper arrangements are now made with the various telegraph companies for the

transmission of reports, and the daily tabulated report is now regularly filed in the rooms of this Chamber.

A very great interest is taken in these reports by this community, not only in consequence of their daily practical usefulness, but there is also a hope that the wide field which you have opened to these observations will afford, perhaps, in the course of time, even greater practical results than at present.

I am, sir, for the Committee, with great respect,

Your obedient servant,

E. HOVEY FROST,
Chairman.

CHARLESTON, S. C., *Nov. 9th*, 1871.

Gen. A. J. MYER,

Chief Signal Officer, U. S. A.,

Washington, D. C.

GENERAL: The weather chart in the rooms of the Chamber of Commerce attracts great attention. It is particularly interesting to the cotton factors, and I have been requested to ascertain if we could not have the report from Montgomery, Ala.

The object is to know the weather in the whole cotton belt or cotton raising region, and the report from Montgomery is, therefore, desired.

Ship-masters and others wishing to consult the weather chart, are invited through the newspapers to visit our rooms for that purpose, and it is daily exciting more attention and interest.

Very respectfully,

Your obedient servant,

C. GRAVELEY,

For the Committee on Reading Room, Chamber of Commerce.

Sergeant Evans is very attentive, prompt and efficient.

TENNESSEE.

The Signal Service.

We are pleased to note throughout the entire country a growing appreciation of the work doing by the Meteorological Signal Service. Of the full importance of this, only the inhabitants of seacoasts, and sea-faring people, can form a just appreciation. To them some foreknowledge of the weather is indispensable. The need has long since made coasters and seamen weatherwise beyond other people. But while this knowledge is so needful on the sea, it is far from useless to those who dwell inland. We refer in the first place to the forecasts of weather, because this is the work by which the public know best, and most esteem the Signal Service; but this is as yet by no means the work which the Signal Officer esteems most. He finds plenty of work to do in watching and recording without prophesying. Sufficient for the day is the work it brings, and the probabilities that are appended to the daily reports are not strictly required by the work in hand.

The science of Meteorology is as yet in its infancy, and owing to the immense field over which it extends, and the exceedingly variable elements with which it has to deal it has necessarily been occupied with observation and collection of facts and phenomena. That there are already sufficient data in the hands of the meteorologists whereon to base very trustworthy conjectures is very manifest, from the many palpable hits made every week in forecasting the weather.

But these data are for the present necessarily determined from very general causes. Meteorologists have learned that

the changes of weather occurring at any given point to-day are but the far-reaching result of widely extending causes, which are in turn but parts of great systems encompassing wide zones of the land and sea. It has become absolutely essential to the development of the science of meteorology that wide circuits of the earth should be mapped off and careful observations kept of every change, and these records carefully compared. As we look over the wide field and estimate the immense amount of patient research which is indispensable to any approach towards accuracy, we cannot but marvel at the success already attained.

The subject of meteorology has engaged the official attention of the leading governments of Europe since 1853, when a conference, consisting of representatives from the various maritime countries, met at Brussels. It was the agreed aim of that conference to secure the taking of accurate observations with correct instruments throughout the widest possible scope of sea and land. In accordance with this purpose, instructions were issued by most of the governments to their naval and mercantile officers to institute such observations and keep such records as were in their power. England opened a Meteorological Department in her Board of Trade, with Admiral Fitzroy at its head. Under the vigorous conduct of the Admiral, the labors of this Department were pushed to all parts of the sea, and an immense mass of information collected bearing on the winds and tides. Communication was opened with France and other European countries, and observations exchanged. The daily communication of the state of the weather is due, however, to M. L. Verrier, the distinguished director of the Imperial Observatory of Paris, who not only sent daily telegrams throughout France, but extended them to the various countries connected by telegraph with Paris. In 1851, storm signals and weather warnings were erected in various British ports, and an attempt made to put to practical use the information obtained. This attempt, however, had not proved satisfactory up to the death of Admiral Fitzroy. From that event the Meteorological

Department was taken under the especial charge of the Royal Society and Board of Trade acting in concert, and has been very greatly improved.

Russia signalized her appreciation of the science by establishing a thorough system of observatories provided with the best instruments to be had, and under the management of the best men to be found. Fortunately for the execution of this plan the telegraph is at the control of the Emperor. In addition the telegraph companies of Europe very generally agreed to send the meteorological despatches free of charge.

In the United States, until very recently, the attention given to meteorological observations has been only incidental and desultory, being confided almost exclusively to volunteer meteorologists. Now, however, it is taken in hand earnestly. General Myer, an earnest enthusiast, is at the head of the Department, and is pushing it ahead, in the face of difficulties and annoyances which would have long since disheartened any but a brave enthusiast. The difficulties were found in the wide scope of country embraced, and the annoyances in the unaccommodating disposition displayed by the telegraph companies. Gradually the difficulties are vanishing, and it is to be hoped that ere a great while all telegraphic annoyances will be removed. The work of the Signal Corps is of incalculable importance to the country, and should be pushed ahead in spite of every obstacle, and we believe it will be.—*Knoxville Whig and Register*, April 23, 1871.

MEMPHIS, *Sept. 18th*, 1871.

General ALBERT J. MYER,

Chief Signal Officer of the Army,

Washington, D. C.

SIR: I have the honor to advise you, in consideration of the regretted removal of Mr. Hugh Coyle from the Signal

Station in this city, that I have had daily opportunity to note his official and personal conduct, and I have the pleasure of stating that his habits have exhibited unexceptional moral tone, personal neatness and cleanliness, punctual, scrupulous, accurate and uniform discharge of his duty as Signal Officer, with prompt observance of every detail, and that his whole conduct and habits have reflected credit upon the Bureau, in whose service he has been.



Witness my official signature and the corporate seal of the Chamber of Commerce.

LEON TROWSDALE,
Secretary.

TEXAS.

The Signal Corps.

We are much gratified that the suggestion made in Flake's Bulletin months ago, that Galveston be made a Signal Station, has been carried out, and that the Government has sent an agent here to attend to that matter.

Mr. Wm. von Hake, Observer Sergeant, is now in the city and will, as soon as possible, locate his office and station, and commence the discharge of his arduous duties, which are, in part, to observe "the signs of the weather," and to furnish the observations to the telegraph office as soon as possible thereafter and always in time to be dispatched to Washington city and throughout the country for the information of all. He will also furnish to the press as often as several times a day, such observations as are made, that

through the press the people may be possessed of all possible information at the earliest practicable moment.

Perhaps during the present century no more important discovery has been made than the one of prognosticating the present to discover the results upon the future, and thus enable us to guard against "approaching storms, hurricanes and foul weather." Could we but look one moment into the future, all danger could be avoided and eternal safety be our lot.

This great discovery enables us to approach as near to the future as is possible, and is, therefore, a *desideratum* in the science of preservation. We understand from Mr. Hake that other stations will be established along the Gulf coast.—*Flake's Daily Bulletin, Galveston, April 14, 1871.*

Weather Reports.

Among our pictures is one entitled, "The Weather Prophet." A good man and his ancient dog are looking out of a window. He has taken his pipe from his mouth, cocked his weather eye skyward, and is looking wise as he discusses with "the old woman" the kind of weather that we shall have on the morrow. Pictures like these will soon be historic. The little paragraph that Sergeant Hake daily contributes to our morning paper will shortly be of more value than many weather prophets. His few recorded observations are being deduced, and in a few months we shall know the weather of to-morrow with the same certainty that we now know next year's eclipse. It will not be a long period until we shall ring for our morning papers to ascertain the propriety of changing woolen for cotton, and Madam will look at Saturday's news to decide on Sunday's bonnet. Farmers will send to the postoffice for intelligence when the ground will

be fit for plowing and for shearing sheep. Sailors will guide their ships by the weather reports, and lovers select fair weather evenings as they now do those which have moonlight. These are a few of the great results which will come from weather reports.—*Galveston News*, May 20, 1871.

Important Predictions as to the Storm.

On last Thursday at noon the telegram sent from Washington, D. C., gave the following statement:

“It is probable that partially cloudy and pleasant weather will be experienced on Friday from Missouri to Virginia, and northward. It is probable that rain and high winds will prevail on the Gulf, west of Florida, during the night.”

The next despatch, sent the next day, said:

“It is probable the high winds on the Gulf will advance, with rain, to the coast of Louisiana.”

The New Orleans papers tell us that the prediction is a disastrous reality; that the southeasterly wind has been very violent and damaging. How well the prediction has been met at this city we too well know.

The fulfillment of these prophetic statements shows the vast importance of heeding the timely warnings of these important barometrical reports. This one warning and its certain fulfillment should not be forgotten in the future.—*Daily Bulletin*, Galveston, June 6, 1871.

LAST NIGHT the Chief Signal Officer, charged with reporting and prognosticating the weather, reported from his headquarters, at Washington City, that “southwesterly winds, with partially cloudy and warm weather, will probably prevail on the Gulf coast on Friday.” And it was so, and more so.

Long before day the clouds began to pour copious libations upon the thirsty earth at Galveston; and this morning the low grounds had become sweet water lakes, and the ditches poured like mountain torrents. The rain was most timely and welcome, as we learn that the venders of water had already put on a high tariff, and were rejoicing in the prospect of great profits from the poor people who were compelled to buy water.—*Galveston Civilian*, July 28, 1871.

GALVESTON, TEXAS,
June 15th, 1871.

Gen. A. J. MYER,
Chief Signal Officer, U. S. A.,
Washington, D. C.

SIR: The Meteorological Committee of the Galveston Chamber of Commerce acknowledges the receipt, through Sergeant von Hake, of one copy of the weather map of the War Department.

By arrangement with the Library Committee, this map has been hung in the Reading Room of the Galveston Mercantile Library, and the room has been thrown open to the masters of ships in active service, as will be seen by the following resolution of that Committee:

“*Resolved*, That the weather chart contributed by the Chief Signal Officer, U. S. A., be hung in the Reading Room, and that free admission to the rooms of the Galveston Mercantile Library be extended to all masters of vessels in active service, and they are hereby invited to avail themselves of the same.”

At the last meeting of the Chamber reference was made in discussion to the benefits deriving to commerce and agriculture, from the labors of your Bureau, and the opinion was expressed that much loss would have been saved to our

community from the late storm, had there been stations north and west of us to advise us of its approach.

Will you please inform me if it is contemplated to establish such?

The members of the Meteorological Committee of this Chamber are

J. S. THRASHER,

W. RICHARDSON,

C. G. FORSHEY.

Respectfully yours,

J. S. THRASHER,

Chairman Met. Committee.

VERMONT.

THE COMMITTEE to nominate a Committee to act with the Signal Officer in Burlington, reported the following preamble and resolution :

Whereas, Under authority of Secretary of War, and in pursuance of an act of Congress, the Chief Signal Officer of the Army has established a system of meteorological stations for the purpose of the observation and report of storms for the benefit of commerce ; and,

Whereas, In the opinion of the Board, this service is of material importance to the commerce of the country ; therefore,

Resolved, That Peter Collier, McK. Petty and G. G. Benedict, be a permanant committee of this Board to confer with R. R. Martin, the Signal Officer stationed in this city, from

time to time, and to extend to him such assistance as may be in the power of this Board.

On motion of Gen. George J. Stannard, the report was accepted and adopted.

The President submitted the following communication from Robert R. Martin, Observer, Signal Service, U. S. A.:

BURLINGTON, VT., May 22, 1871.

GENTLEMEN:—In compliance with instructions from the Chief Signal Officer, Washington, D. C., I have the honor to inform you that I have been appointed observer at this station. I have secured an office in the City Hotel building, on Main street, fronting the public square. If all my arrangements are completed in time, it is expected I will be able to make my reports regularly on and after the morning of the 24th inst. Any advice or assistance you may desire to offer will be thankfully received.

Very respectfully your obedient servant,

ROBERT R. MARTIN,

Observer Signal Service, U. S. A.

The report of the Committee on By-Laws was called up and adopted.

Robert R. Martin, Observer of the Signal Service in this city, was elected an honorary member of the Board of Trade.—*Free Press, Burlington, May 29, 1871.*

VIRGINIA.

IT IS ANNOUNCED that the War Department will, during this week, issue daily from the Signal Office at Washington, a synopsis of the state of the weather throughout the country, together with a forecast of the probable changes during the ensuing twenty-four hours. This intelligence will be communicated to the press; and if it be possible for us to lay it before our readers every morning, in time to make it available, we shall publish it regularly in the Journal.

The advantages of the Signal Service to the mercantile marine of the country render it one of the most valuable attainments of the age, in the practical application of science to every-day business life. It enables us to form an accurate idea of the state of the weather thousands of miles off; and to calculate from the directions of the winds, quite correctly as to the changes about to take place.—*Norfolk Journal*, February 15, 1871.

The Clerk of the Weather.

We have him at last. Not a figment of the mind, a pleasantry of the imagination, but an actual living, breathing, intelligent, highly cultivated, good man—so good that he does not know the good he is doing, nor does any human being know, for nobody can tell what the ultimate effect of his researches will be. A very curious man he is, withal. He has more hands than Briareus, more eyes than Argus, he never sleeps, and his nerves are of iron. Well they may be, for there is no whim, caprice, ill-humor, passion or rage of

his mistress, the weather, which he dare fail to watch in its every detail, with the devotion of a lover and the attention of a man of science. He is the Boswell, of the clouds, the Jenkins of the dew, the man Friday of the thunder, the most obedient, humble servant and lackey of the lightning.

His name is General Myer. He is chief of the United States Signal Bureau, and his office is in Washington City. His eyes are the eyes of his assistants, scattered from the lakes to the Rio Grande, and from Maine to California; his hands are the thermometer, barometer, anemometer, hygrometer—instruments which his assistants use; and his nerves are the telegraphic wires which put him in immediate communication with these instruments, wherever they may be. Thus he is a compound man, whose constituent parts are distributed over thousands of miles of territory, each part performing its allotted duty in registering the freaks of his mistress, the weather, but all concentrating their energies in one direction, and transmitting their records to Washington, and leaving them to be classified, arranged, and made intelligible in the *sensorum commune*, the brain of General Myer. A busy man he must be; a useful man he unquestionably is.

Although he has been paying attention to his capricious mistress for a number of years, it is only of late that his suit has been so rewarded as to justify him in telling the public what progress he has made. At first there were many who feared that he was a little premature in his announcement, but the daily bulletin which he is kind enough to furnish us shows that he knows what he is about, and can tell with wonderful accuracy what the fickle jade's temper will be for twenty-four or thirty-six hours to come. Many a lover and every husband would be glad enough to forecast the domestic horizon half as well as General Myer.

By and by, when the General, who is now engaged, is fairly married to the weather, we may expect better things. Who knows that he will not be able to tell what the state of the weather will be for a week ahead? The general accuracy of his predictions would seem almost to justify such an ex-

pectation, and, if his assiduous attentions to his stormy spouse do not shorten his days, we may at least look for warnings of forty-eight instead of twenty-four hours. He is a strange man, and likes his mistress best when she is most objectionable to other people—moody, fretful, and even tempestuous. When she is calm and sweet, he takes no interest in her, but busies himself in tabulating her ill-humors for days, weeks and months past. Accordingly, we may hope to see him attain a good old age.

Meteorology has long been the opprobrium of science. So hopeless, indeed, seemed the task of reducing to order the phenomena of the atmosphere, that Comte, only thirty years ago, in constructing his fanciful hierarchy of the sciences, likened meteorology to sociology—the highest and least developed of the sciences—in this, that the atmospheric particles, subjected to incessant changes, were comparable only to individual men endowed with volition and subject to myriads of influences alike from inanimate and animate nature. Vast and intricate as the problem was, Comte recognized the reign of law in meteorology as in all things else in nature, competent observers having already traced not only the ordinary currents of the air, as in the trade winds, but also the variable paths of the most furious storms. Espy's theory, then or soon afterwards given to the world, has been, in the main, confirmed by subsequent investigators; and, although the origin of the cyclone is yet a matter of dispute, as Prof. T. B. Maury shows in the March number of *Scribner's Magazine*, yet the data accumulated during the last quarter of a century, furnish material for generalization much wider than were possible in Comte's day.

Meteorology, waiting for the telegraph, as astronomy waited for the telescope and spectroscope, and biology for the microscope and the aplanactic searcher, is now about to assume the position of an exact science. The wide expanse of the United States, interrupted by few mountain chains, constitutes a field of observation equal almost to the ocean

itself for the study of meteorological phenomena, and is even better than the ocean, in that it furnishes signal stations so numerous and so connected that the circuit of electric communication may be said to embrace almost an entire continent. Here, then, for the first time in the history of meteorology, the conditions precedent to the formation of a science are fulfilled, and we shall be disappointed if General Myer and his corps of assistants do not, within the coming twelve or eighteen months, chronicle triumphs in his special Department as incontestable and honorable to American science as were the achievements of American astronomers in establishing the nature of the sun's corona at the time of the eclipse in 1869.

The importance of meteorology to commerce and agriculture cannot be overestimated. As production and transportation are the bases of nine-tenths of the practical business of the world, this point need not be dwelt upon. The point of interest to the student, however, is the possible effect of the reaction of a science, into which new life has been infused, upon other sciences, and with this view the labors of the clerk of the weather at Washington will be watched with absorbing attention by cultivated men in every part of the globe.—*Richmond Enquirer*, March 28, 1871.

A Glympse of the Cyclone.

The great Southern cyclone, the appearance of which on our coast was predicted with such great accuracy by "Old Probability," as General Myers is facetiously called, was described by us, in part yesterday, but the picture was incomplete. In the West Indies it burst with tropical fury, and there, where the two adverse forces met which give the rotary motion from which the storm takes its name, the destruction was appalling, especially in life. Its force happily abated as it reached our more temperate latitude, but we

cannot review its ravages to the south of us without a feeling of unaffected pain. In Florida for example, where the cyclone first struck the Atlantic coast its fury was felt with unexampled violence. The cane was twisted off and carried before the wind like down; great trees were uprooted as if by the hand of a giant and their boughs stripped off, never to reappear like those fabled by the poet, were blown about with the most destructive violence; the cotton has been damaged beyond computation; fences have disappeared, as if consumed by an invading army; and, in short, the track of the storm can only be contemplated with the most profound sorrow. We have already given some account of its ravages, but that only gives a very limited idea of the general devastation. Such details convey to us no more idea of the general results than the examination of a contested orchard after a great battle would convey of the carnage of the fight along a line of battle measured by many miles. But, they are enough to sadden us, and to awaken in all thinking men a still greater appreciation of that branch of the public service which predicts for the seaman and the farmer alike the coming of the gentle rains, or the desolating tempest. This has already proved of incalculable value to our coasting trade, and under the administration of General Myer, who has shown rare capacity for his work, we hope to see the system expanded so that the whole country will be divided into agricultural districts, each with its depot, from which news may be scattered through the surrounding country. One season would repay the expense of this costly improvement in the present system, and we trust that Congress will not be slow to make such necessary appropriations as General Myer may consider essential to aid him in the great work in which he is engaged.—*Norfolk Virginian*, September 9, 1871.

WISCONSIN.

CHAMBER OF COMMERCE,

Milwaukee, February 1, 1871.

At a meeting of the Chamber of Commerce of the City of Milwaukee, held this day, the following action was taken at the recommendation of the Committee on Weather Reports:

“*Resolved*, That this Chamber of Commerce strongly endorses the following preamble and resolutions recently adopted at a special meeting of the Board of Trade of the City of Detroit, viz.:

“*Whereas*, This Board is deeply impressed with the importance, and value to commerce, of the system of signals recently inaugurated through the beneficence of our Government, as well as of the desirability of perfecting the system, so far as changes can be made directly calculated to subserve the great and rapidly developing interests sought to be promoted; and

“*Whereas*, No stations have been located in the lake region, between Milwaukee and Detroit, a circuit of 600 miles in extent, embracing the main track of the commerce of the lakes, the navigation of which is attended with more than ordinary peril; therefore,

“*Resolved*, That Congress is hereby respectfully requested to appropriate a sufficient sum to secure the establishment of signal stations at Escanaba and Huron City.”

“*And be it further Resolved*, That this Chamber of Commerce respectfully requests Congress to make the appropriation sufficient to enable the Secretary of War to also estab-

lish signal stations at Marquette, Lake Superior and Grand Haven, on Lake Michigan. There is at the present time, but one signal station located upon Lake Superior, at Duluth, at the head of the Lake. Telegraphic communication is had with this point, at present, only by the way of St. Paul, and is liable to frequent interruption by storms, and in such cases there is no means of getting notice of the progress of storms sweeping over this great inland sea. Marquette is connected with the general telegraphic system of the country by a line extending across the Peninsula to Escanaba, and thence to Green Bay, and possesses an extensive lake commerce in the shipment of iron and iron ore. We regard it as a point of not less importance as a signal station than Duluth, besides having a very much larger commerce than the latter.

“There is as yet no signal station upon the east shore of Lake Michigan, with its numerous harbors and its extensive lumber trade; and in case it should not be deemed necessary at present to establish more than one station upon that shore, this Chamber would decidedly recommend Grand Haven as the most appropriate location, this being the terminus of several steamboat lines connecting with the railroads running east, south and north, and having the best harbor on that side of the Lake.

“*Resolved*, That the Secretary be instructed to forward copies of this action to our Representative in Congress, the Chairman of the Committee on Commerce, and the Secretary of War.”

ANGUS SMITH,
President.

Attest: WM. J. LANGSON,
Secretary.

CHAMBER OF COMMERCE,

Milwaukee, May 22, 1871.

Gen. ALBERT J. MYER,

Chief Signal Officer, U. S. A.,

Washington, D. C.

SIR: By direction of the Meteorological Committee of this Chamber, I have the honor to acknowledge the receipt of your letter of the 20th inst., and to express their satisfaction at the promised renewal of the weather reports for the benefit of Commerce.

The Committee, further direct me to say, that you shall be promptly advised of any delay, or irregularity in the publication of reports at this city.

They also desire to bear testimony to the general accuracy, (so far as this locality is concerned,) of the daily synopsis of reports issued from your Department, and the value of these reports, to both the commercial and agricultural interests, in indicating so correctly the probable changes of the weather. The Committee beg leave to express the hope, that these reports for the press, will be continued.

Respectfully, your obedient servant,

WM. J. LANGSON,

Secretary.



APPENDIX.



APPENDIX.

BOARD OF TRADE OF THE CITY OF TOLEDO,
SECRETARY'S OFFICE,
Toledo, January 24, 1871.

Hon. E. D. PECK,
Washington, D. C.

DEAR SIR: The Toledo Board of Trade, adopted the following by a unanimous vote:

Resolved, That our Representative in Congress, be requested to use his influence to secure the establishment of Storm Signal Stations at Escanaba, Muskegon, and Huron City.

These points are very much exposed to storms, and under the present arrangements, there are about 600 miles of lake coast, between Detroit and Milwaukee without a Signal Station. Our Lake Marine requires the establishment of stations at the points named.

Respectfully,

CHAS. T. WALES,
Secretary.

BOARD OF TRADE ROOMS,
Cleveland Ohio, February 8, 1871.

R. W. GILLET, .
President of Detroit Board of Trade.

SIR: The following preamble and resolution were unanimously adopted by the "Cleveland Board of Trade" at its session of January 17, 1871.

Whereas, This Board is deeply impressed with the importance and value to commerce of the system of signals recently inaugurated through the beneficence of our Government, as well as of the desirability of perfecting the system, as far as changes can be made directly calculated to subserve the great and rapidly developing interests sought to be promoted; and

Whereas, No stations have been located in the lake region between Milwaukee and Detroit, a circuit of six hundred miles in extent, embracing the main track of the commerce of the lake, the navigation of which is attended with more than ordinary peril, therefore,

Resolved, That Congress, is hereby respectfully requested to appropriate a sufficient sum to secure the establishment of Signal Stations at Escanaba, Marquette, and Huron City.

Attest,

J. C. SAGE,
Secretary Cleveland Board of Trade.

DETROIT, *February 17th*, 1871.

Chief Signal Officer of the Army,
Washington, D. C.

DEAR SIR: Enclosed find certificate copy of the Cleveland and Detroit Boards of Trade, asking that a Signal Station be established at Escanaba and Huron City, and Cleveland has asked in addition for one at Marquette, which is much wanted also. A glance at the map will show how far these stations would be from each other; also that they are directly on the track of the largest amount of the lake commerce. Would say that it is not important to keep those stations in operation during the winter.

Senator Chandler, I think, will give you assistance in this matter if shown this, as he knows the situation of these points, and the extent of the lake commerce.

Hoping we may get the stations,

I am, respectfully,

G. W. BISSELL.

STATE OF MAINE.

RESOLVES IN FAVOR OF A SYSTEM OF STORM WARNINGS IN THE
STATE OF MAINE.

* * * * *

Whereas, By an Act of Congress, passed at the last session, the Secretary of War was authorized to establish a system of storm warnings, and believing that such a plan, if properly carried out, would be of much practical advantage to the industries of the country; therefore,

Resolved, That Congress be requested, through the Secretary of War, to test a system of storm warnings by means of the telegraph and signals in this State, for the benefit of agriculture and commerce, and protection against floods.

Resolved, That a copy of these resolves be sent to the Secretary of War, and also to each of our Senators and Representatives in Congress, requesting them to use their influence in furtherance of the above design, and the testing of the plan in our State.

In the House of Representatives, February 23d, 1871.

Read and passed finally.

EDWIN B. SMITH,
Speaker.

In Senate, February 24, 1871.

Read and passed finally.

CHARLES BUFFUM,
President.

* * * * *

FEBRUARY 24th, 1871.


Approved.

SIDNEY PERHAM,
Governor.

* * * * *

STATE OF MAINE,

Office of the Secretary.

 I hereby certify that the foregoing is a true copy of the original, as deposited in this office.

FRANKLIN M. DREW,
Secretary of State,

CHARLESTON CHAMBER OF COMMERCE,
CHARLESTON, S. C., *March 20, 1871.*

To Capt. H. W. HOWGATE,
Acting Assistant Signal Officer,
Washington, D. C.

DEAR SIR: I have received, by the hands of Sergeant J. E. Evans, a copy of your circular and a printed report relating to the "observations and report of storms by telegraph and signals."

Permit me, in behalf of the Chamber, to thank you for this document, and further, to say that Sergeant Evans has, for some time past, daily furnished our bulletin boards with reports of the weather from principal points in the Union, which are read by our merchants with much interest.

This interest seems to be increasing as the advantages to commerce arising from this system of observation and record becomes more apparent. It gives me pleasure to say that Sergeant Evans is active and intelligent in the discharge of his arduous duties, and, with great courtesy, explains much of the phenomena of this new branch of science.

With much respect, your obedient servant,

S. Y. TUPPER,
Acting President of Chamber of Commerce.

SAVANNAH CHAMBER OF COMMERCE,
March 31, 1871.

SIR: I am in receipt of your obliging letter of the 28th March, covering copy of your preceding one of 13th December, received during my absence in Europe.

At the quarterly meeting of our Chamber next month, a Special Committee will be appointed to take charge of all matters relating to meteorological observations at this port, meanwhile it will afford me pleasure to receive suggestions

of any direction in which this Chamber can be of service to you.

I take this opportunity of representing how important it is to our rapidly extending commerce to receive your reports from at least all the shore stations, and if these included San Francisco the interest would be enhanced, enabling us to compare the atmospheric changes of the Atlantic and Pacific coasts.

Our lines of steamers establishing daily communications with the northern ports and the commercial marine, essential to the export of products, reaching this year sixty millions of dollars in value, demand all the intelligence of science for their protection.

May I be allowed to state, that the room at present occupied by your attentive expert at this point (Sergt. Held) is illly situated. It has an adverse exposure and is generally unsuited to the nice operations of his department.

I may not close without mentioning the wide interest your published meteorological reports have for our community and the singular accuracy, with which their predictions have been verified here.

I remain sir, with great respect,

CHARLES GREEN,
President.

To Gen. ALBERT J. MYER,
Chief Signal Officer, U. S. A.

NORFOLK, VA., *April 13th*, 1871.

Capt. H. W. HOWGATE,
Acting Signal Officer, &c.

DEAR SIR: About two weeks since the undersigned were appointed a Committee on the part of the Norfolk Board of Trade to communicate with you, and to tender our cordial coöperation in furthering the objects designed to be attained

by the establishment of the meteorological service. It is probably well known to you that Hampton Rhodes is the safest and most accessible harbor for all vessels passing near the Capes of Virginia, bound north or south, and it is not unfrequently the case that a hundred or more sail find refuge and may be seen anchored here. No part of the southern seacoast is more dangerous to commerce than that stretching from the Capes of Virginia to Hatteras Inlet, and information regarding disasters occurring along that part of the coast can be, and is more readily communicated to Norfolk than to any other point.

With the perils of the Hatteras coast you are doubtless familiar. About thirty miles north of Hatteras is Body Island, along whose shore more vessels have been stranded than at any other point of the South Atlantic seaboard. If a telegraph line could be established from Norfolk to Cape Henry, and thence along the coast to Body Island and Cape Hatteras, with signal stations at these three points, namely: Cape Henry, Body Island and Hatteras, it would furnish the means of conveying information which would prove of incalculable advantage to American commerce. All vessels then sailing out of the Chesapeake Bay could be readily warned of any probable danger, and those having sought refuge in Hampton Rhodes could be informed as to the time they might move out in safety. We presume it unnecessary to amplify these suggestions, as their importance and feasibility will readily commend themselves to you.

We take pleasure in bearing our testimony to the activity and faithfulness of Sergeant Smith, who has spared no pains to render successful the purposes you have in view. To this end also we will be at all times ready to coöperate with you.

We are, very respectfully, and truly yours,

C. BILLUPS,

W. A. GRAVES,

E. C. LINDSEY,

Committee on part of Norfolk Board Trade,

CHAMBER OF COMMERCE,
CHARLESTON, S. C., *May* 31, 1871.

Gen. ALBERT J. MYER,
Chief Signal Officer, U. S. A.,
Washington, D. C.

SIR: The Committee of this Chamber on "Meteorological Observations" are obliged for your letter of 20th instant, and have only to repeat their assurance that any assistance, in their power to render, either to the agent of the United States here or to your Department, shall be cheerfully given.

They are pleased to notice that proper arrangements are now made with the various telegraph companies for the transmission of reports; and the daily tabulated report is now regularly filed in the rooms of this Chamber.

A very great interest is taken in these reports by this community, not only in consequence of their daily practical usefulness, but there is also a hope that the wide field which you have opened to these observations will afford, perhaps, in the course of time, even greater practical results than at present.

I am, sir, for the Committee, with much respect, your obedient servant,

E. HARRY FROST,
Chairman.

CHAMBERSBURG, PA., *June* 7, 1871.

Hon. SIMON CAMERON,

DEAR SIR: I wrote you, at the instance of the Franklin County Horticultural Society, (whose President, Dr. J. L. Suesserot, has always been your firm friend,) to say that this Society is very anxious to have Chambersburg made a Signal Station, attached to the Weather Signal Service, to furnish daily reports to the Chief Signal Officer connected with the War Department at Washington.

There appears to be no such station east of the Alleghany Mountains, and no observations are made or recorded in the valley extending from Philadelphia to Tennessee, and the peculiar geographical features of the country here, viz.: high mountain spurs with summit level, crossing the valley near Chambersburg, would make it a very suitable point for such station. The agricultural interests of this valley would, we think, be greatly benefited with a station such as I speak of, in this central valley town. Hoping you will find it convenient and agreeable to use your influence to secure the desired Signal Station at this place, I subscribe myself,

Your obedient servant,

F. S. STAMBAUGH.

CHAMPAIGN, ILL., *July 21st*, 1871.

ALBERT J. MYER,

Brigadier General, &c.,

Washington, D. C.

SIR: I have received, sent to me as Secretary of the Illinois State Horticultural Society, (a position now filled by O. B. Galusha, of Morris, to whom I hope you will address a second circular,) your circular in relation to storm signals. I take the liberty of replying to it as Secretary of the Illinois Industrial University, an institution founded on the national grant of lands for the benefit of agricultural and mechanical education.

The attention of our agricultural communities, as you are aware, has for some years been drawn to the subject of storm signals for times of harvest and haying. It seems quite clear that, although the original intention of Congress was only the protection of shipping, the aggregate damage to the agricultural interests from summer storms, at least, is far greater than to commerce. We shall feel very grateful

to you, therefore, for endeavoring to do what Congress seems to have overlooked, and aiming to give the great producing classes the benefits of your valuable work.

I think there is no doubt but that storm signals may be made useful to the farmer:

1. In the time of spring planting, when twelve or twenty-four hours' notice of a coming storm might enable him to get his crop planted before rain.

2. In the season of harvesting the small grains and cutting meadows, when immense aggregate losses might be prevented by a few hours' general notice.

3. Winter storms are often a cause of great loss, when severe, from the destruction of live stock, and exposure of products that might easily be housed and protected by a few hours' notice.

4. The same is true of the early frosts of autumn, often very destructive to ripened fruits and vegetables, and of the late frosts of spring that destroy buds and bloom. The effects of these could be much mitigated with a little fore-knowledge.

These suggest some, though not all the practical points to be arrived at. I speak only of the cases where immediate fore-knowledge of the approach of storms is the vital point. As to other points of equal importance, but not so pertinent to the present purpose, permit me to call your attention to the enclosed fragment of an address by Professor Turner, which we are about publishing at length with a diagram in our annual report.

A difficulty arises in the case of agricultural communities as to the means of rapidly communicating the information of the approach of storms. Our daily papers do not reach farmers enough, nor promptly enough. The firing of cannon at fixed points has been suggested, but I think as your Office increases in the extent and accuracy of its information and prognostications, the information it furnishes will be sought more eagerly and travel very rapidly, even by word of mouth, from railway stations into the back country.

Premising this much, and that I have just been reading in this connection the article of Professor Maury on the "Telegraph and the Storm" in the August number of Harper's Magazine, in which the workings of your Bureau are explained, I would respectfully suggest a few ideas growing out of the position and wants of this institution, and the lack of a representative station in the great agricultural region of Illinois. The University is situated on the grand prairie of Illinois, some 125 miles south of Chicago, on the Illinois Central railway, and convenient to telegraphic stations.

Indianapolis, I presume, is the nearest Signal Station. The location and the character of the institution both suggest that a meteorological station could, with special propriety, be established here. It is right among the practical farmers of the west. It is a State institution, flourishing and promising, as you will see by circulars sent herewith, and is specially devoted to the development and elaboration of practical knowledge. This being the case, I would ask whether a station cannot be established here? We have intelligent and industrious young men, who could be enlisted for service, if desired, and who would gladly do the work for the means to further prosecute their studies. I think I may safely pledge the aid and coöperation of the University in furnishing suitable rooms and other facilities, such as may be required for the efficient working of the station. I may add, we have under consideration, and hope yet to be able to establish, an agricultural experimental station in connection with the University, which will suggest a great many practical meteorological investigations, and make it doubly desirable to have a station at this point.

Respectfully yours,

W. C. FLAGG,
Corresponding Secretary.

CHAMPAIGN, ILL., *May 22d*, 1871.

Gen. A. J. MYER,
Chief Signal Officer,
Washington, D. C.

DEAR SIR: I heartily concur in the views of our Corresponding Secretary, Hon. W. C. Flagg, in the communication which this accompanies. The University will lend its coöperation heartily to the work, if you shall select this as one of your stations. The prominence which recent legislative action has given the University before the State will make the selection of this point peculiarly agreeable to our leading public men of the State, and to the great agricultural classes. We have several students who are peculiarly fitted for the performance of the duties required.

With great respect, I am truly yours, &c.,

J. M. GREGORY,
Regent of University.

Extract from the Proceedings of the Second Annual Session of the State Medical Association of Arkansas—Held at Little Rock, November 5th and 6th, 1871.

* * * * *

“That the operations of the Signal Corps be so extended as to embrace every portion of the Union; that a station be located at the capital of every State and Territory, and at other advisable places, from which shall be sent daily reports by telegraph to the Federal Capital, of the temperature, weather, currents of wind, ozonic state of the atmosphere, and everything of scientific interest to the physician and physicist. This is an object worthy the attention and undertaking of a great Government.”

* * * * *

“Scientific associations everywhere throughout the Union should urge Congress, by resolutions, to enact a law making

adequate appropriations to establish stations necessary to complete meteorological observations. Every State and Territory in the Union, by legislative action, through their respective Representatives in Congress, should endorse the movement. We should have established Signal Stations at the Capital of each State, and elsewhere in each State and Territory where the physical features of the country, manifest the importance of daily signal service, to make satisfactory weather and meteorological reports.

Government alone should be intrusted with the service, and proudly should the Government respond for the duty in performing the office. Officials, wherever Signal Service extends, should report the state of the weather, direction and force of the wind, mean temperature, fah., (6 A. M., 12 M. and 6 P. M.) of the atmosphere. Also, barometric, hygrometric and ozonic conditions of the air. The weather gauge at each station should give full particulars—daily record and report the fall of rain, snow, hail, freezing, dew point, etc. If epidemic, endemic, or any diseases are rife in any part of the domain, such diseases should be carefully noted for record. Research thus made in the interest of science, arts and medical literature should be carefully tabulated and regularly reported by the respective departments of the Government. The elevations, mountain ranges, valleys, basins, plains, water courses, all physically determine the most important locations to be selected for Signal Service Stations. The islands margining the Atlantic coasts, Bermuda, Jamaica, Hayti, Bahamas, Cuba, and Key West, Florida, stand prominent, and hold such relations to the continent that weather sentinels on the east and southeast should be erected, and all friendly powers should coöperate for maritime protection. In the Pacific Ocean, the Sandwich Islands, Westerly and the Galipagos Islands, on the southwest of our territory, would give navigators warning when approaching the Pacific coast.

Every phenomenon occurring at any station should promptly be reported for scientific usefulness. To suggest

locations for the greatest advantages in Signal Service and weather reports for the Government, we would add that all the territory embraced from the west coast of the Atlantic Ocean to the Appalachian chain of mountains, from the Appalachian mountains over the Mississippi basin to the Ozark group of mountains, from the Ozark Mountains to the Rocky Mountains, from the Rocky Mountains over the great basin of the Sierra Nevada Mountains, and from the Sierra Nevada Mountains to the Pacific coast range of mountains, with all the important elevations, divides, slopes, basins, prairies, valleys and water courses, to littoral regions, require Signal Stations, for meteorological observations for the advantages of climatology.”

SHEFFIELD SCIENTIFIC SCHOOL OF YALE COLLEGE,
December 14, 1871.

SIR: The undersigned, professors in the Sheffield Scientific School of Yale College, beg leave to ask your attention to the desirability of establishing in New Haven a Signal Station for meteorological observations. The advantage to commerce and to business interests will be suggested to you by the civic authorities and Government officials of the place.

We content ourselves with expressing the belief that by such an establishment the progress of meteorological science will be especially promoted through both direct and indirect influences.

Connected with the academic department of Yale College, and with the Sheffield Scientific School, are several professors who take a particular interest in this class of investigation, and there are here large numbers of young men who are training themselves for public and private service in scientific pursuits, and who will be better fitted for usefulness throughout the land, by a knowledge of the work of the Signal Bureau.

It also deserves to be especially noted that New Haven is one of the very few places on the continent where the meteorological records extend over a period of more than ninety years. These records have been carefully edited and published in the transactions of the Connecticut Academy, and afford an important basis for the comparison of new data.

Under these circumstances the undersigned feel justified in asking that the system of observing meteorological phenomena, which reflects so much honor upon the present administration of the War Department, and upon the officers of the service, may be extended to this centre of scientific researches.

We are, dear sir, yours with high respect,

W. P. Trowbridge,
C. S. Lyman,
L. W. Johnson,
Daniel C. Gilman,
Daniel E. Eaton,
T. R. Lounsbury,
A. E. Verrill,
Geo. J. Brush.

To the Honorable the SECRETARY OF WAR,
Washington, D. C.

CUSTOM HOUSE,
New Haven, December 15th, 1871.

SIR : The undersigned respectfully ask that a Signal Station may be established at New Haven.

In addition to the interests of science, which would be promoted by such a station at New Haven, more than at almost any other place, the importance of such a station here to the interests of commerce seems worthy of especial consideration. According to the last annual report of the Bureau of Statistics, in our possession, New Haven ranks, in

the value of her annual imports, seventh among the Atlantic ports, and seventeenth in the whole country.

New London, in this State, where a station has been established, is twelfth among the Atlantic ports, and thirty-sixth in the whole country. In the value of exports, New Haven is twenty-eighth in the country, and New London fifty-first.

The imports of New Haven during the last fiscal year were nearly one million of dollars. Eighty-one vessels, with a tonnage of 15,239 tons, entered New Haven from foreign countries, while only thirteen vessels, with a tonnage of 3,278 tons, entered New London.

From New Haven, sixty-four vessels, with a tonnage of 11,229 tons, cleared for foreign countries, while from New London, twenty-one vessels, with a tonnage of 2,359 tons, cleared.

The coasting trade of New Haven bears a similar ratio to that of New London. A very large number of vessels find a safe harbor here in times of danger. No place on the coast of this State would, by means of its Signal Station, render service to so large an amount of shipping.

While, therefore, we concur heartily in the petition of the Professors of the Sheffield Scientific School of Yale College, for the reasons therein stated, we earnestly petition you to establish a Signal Station here in the interests of commerce as well as of science.

CYRUS NORTHROP, *Collector of Customs*,
WM. H. RUSSELL, *Collector Internal Revenue*,
N. D. SHERRY, *Postmaster*.

HON. WILLIAM B. BELKNAP,
Secretary of War,
Washington, D. C.

MAYOR'S OFFICE,
City of New Haven, Dec. 18, 1871.

To General ALBERT J. MYER,
 Chief Signal Officer of Signal Service,
 War Department.

The Mayor and Court of Common Council of the City of New Haven, State of Connecticut, would most respectfully represent to the War Department that, in their opinion, a necessity exists for locating a Signal Station at the Port of New Haven, far greater than that of any port on the Connecticut coast.

It is one of our largest ports, and is increasing in importance from year to year; and of all the ports on the Atlantic coast, in value of imports it ranks seventh, while New London ranks twelfth; and of all the ports in the country New Haven ranks seventeenth, New London, thirty-sixth.

In value of exports, New Haven ranks twenty-eighth, and New London fifty-first.

In addition to New Haven as a port of entry, your petitioners would respectfully represent that a great majority of all the vessels, foreign or coast-wise, passing through Long Island Sound, pass by and near to the Port of New Haven, and that it is more used as a shelter (being a safer harbor, in case of violent storms,) than any other port on the Sound.

In view of these facts, and very many others that might be adduced, your petitioners would most respectfully request, and strongly urge, that a Signal Station be located at the Port of New Haven, and as in duty bound they will ever pray.

Very respectfully,

HENRY G. LEWIS,
 Mayor.

Signed by the following Aldermen of New Haven:

Charles S. Scott,	Thos. M. Gwin,
Cornelius Pierpont,	Stiles Stevens,
Lucius A. Thomas,	Stephen R. Smith,

Wm. W. Morse,
Elias Pierpont,
John Egan,
T. H. Fulton,

H. H. Bunnell,
Francis Donnelly,
E. P. Goodsell, Jr.,
Wm. H. Bradley.

Also signed by the following members of the Board of Councilmen:

E. G. Stoddard,
Thomas D. Jones,
Henry D. Barnes,
Daniel Carroll,
S. F. Benton,
James Kinsella,
Thomas McWeeny,
John L. Disbrow,
Jacob Mailhause,
Johnson T. Platt,
Julius Troiss,
Patrick Holland,
W. H. Brown,
D. S. Cooper,

John C. Ritter,
Geo. Wm. Reed,
Geo. Blakeman,
Wm. J. Atwater,
Wm. T. Scranton,
Jno. B. Adriance,
Jonathan Ingersoll,
Horace P. Dibble,
Albert Thomas,
Martin Bergin,
John J. McMahon,
John Ruff,
Frank Altmann,
Carlos Smith.

State of Connecticut, }
New Haven County. } ss.

CITY OF NEW HAVEN,
City Clerk's Office, Dec. 18, 1871.

I hereby certify that the above signatures to the petition for locating a Signal Station at the Port of New Haven are the signatures of each and every member of the Court of Common Council of said city.

In testimony whereof I hereunto set my hand
{ CITY } and affix the seal of said city.
{ SEAL }

TIMOTHY J. FOX,
City Clerk.

Endorsed as follows:

I earnestly urge the granting of the within application. The commerce of New Haven is rapidly increasing, nearly doubling the past year, owing to various causes, among them the improvement of the harbor now being made.

S. W. KELLOGG,
M. C., 2d District, Conn.

ROOMS CALIFORNIA STATE BOARD OF AGRICULTURE,
Sacramento, December 27, 1871.

GARRICK MALLERY,
Captain, &c., and Acting Signal Officer, &c.,
Washington, D. C.

DEAR SIR: We have lately been visited by two storms on this coast, the first of which was foretold with a degree of correctness as to time and severity from your Office that has astonished every one. The latter was also foretold with almost equal correctness at the San Francisco Station. These facts have called universal attention to the value and importance of the service, and created a desire in this vicinity that a station may be established at Sacramento.

In obedience to this desire the State Board of Agriculture, at a meeting held on the 26th instant, added Dr. T. M. Logan, of this city, to the committee heretofore named. Dr. Logan is one of the best meteorologists in the State, and occupies the office of meteorologist to our Board of Agriculture. It is hoped if the facilities at the command of the service do not now warrant such establishment here, that Congress will, at an early day, give it the necessary means.

I am, very respectfully, your obedient servant,

J. N. HOAG,
Secretary Meteorological Committee
of California State Agricultural Society.

CAIRO, ILL., JANUARY 1, 1872.

MR. THOMAS L. WATSON,

U. S. Meteorological Observer,
Cairo, Illinois.

DEAR SIR: We the undersigned, citizens of Cairo, and others interested in the commerce of the western rivers, believing that the cautionary signals now authorized by the War Department Signal Service, will be of great benefit if given from this point, do most earnestly request that you will communicate with the Department and secure this end, if possible. The building in which your office is located, and from which we would suggest the signals be displayed, can be seen for miles up and down the Mississippi river, and for a longer distance up the Ohio river. It seems to us that for the good of commerce these signals are particularly needed at this point, where all boats from Pittsburg, Cincinnati, St. Louis, and all northern ports, and *vice versa*, and at which, during a portion of the year, many of them receive their entire cargoes. The signals displayed at Cairo, being at the confluence of the two great rivers, would serve the double purpose of warning to Ohio and Mississippi river boats; and in this connection, we would also request that you secure to us, if possible, reports from Keokuk, Iowa, and Knoxville, Tennessee, as to the rise and fall of the rivers at these points, and also the condition of the rivers there, during times when navigation is impeded by ice or other causes. We deem this of great importance. Please forward this communication to the Department, with such arguments as may suggest themselves to you in behalf of these objects, and you will greatly oblige the whole commercial interests of the Ohio and Mississippi river.

Peter Catil,
W. Hyslop,
James W. Stewart,
A. B. Safford,
P. S. Yocum,

M. C. Wright,
Str. Cairo, City Whf. Bt.,
O. B. Hunter, *Str. J. Fisk, Jr.,*
S. Beaty, *Str. Shannon,*
Thos. J. Shands, *Str. Julia,*

W. H. Morris,
 H. H. Candee,
 Ben. M. Hagey,
 Chas. Pink,
 A. D. Graham,
 Wm. H. Green,
 G. W. Kleorlis,
 Mannay Mayfield,
 J. M. McKinney,

Str. Illinois,

J. B. Hudson,
 W. E. Green,
 John Antrim,
 C. R. Woodward,
 W. P. Halliday,
 F. S. Kent,
 Theo. Carrigan,
 A. C. Coleman,
 C. R. Hurd,
 H. L. Halliday,
 R. P. Robbins,
 D. Hartman,
 John Borpple,
 W. O. Gall,
 W. J. Montague,
 G. D. Williamson,
 Chas. Leeds,
 A. Shinkle,
 J. S. Barclay,
 D. Hurd,
 Chas. R. Hurd,
 John H. Beecher,
 C. C. Davidson,
 W. H. Early,
 S. M. Orr,
 F. Bross,
 Carl L. Thomas,

John Gwathway,
Str. H. M. Shreve,
 James Mellory, *S. B. Agt.,*
 E. E. Bowers,
Str. K. Longworth,

Levi Kates, “ “ “
 P. L. Davidson,
Supt. N. W. Str. Co.

Jas. Keniston, *Str. Tom Jasper*
 N. B. Hatcher, “ “

J. M. Phillips, *Whf. Proprietor*

J. T. West, *Str. City of Quincy,*

Thos. Poe, *Str. M. E. Poe,*

A. Kehrer,

Chas. R. Kyle,

Thos. W. Halliday,

Geo. H. Rea,

Pret. Miss. V. T. Co.

James H. Brown,

W. A. Storer,

Louis Herbert,

James Biggs, *Steam Boat Agt.,*

Geo. McDonald,

P. W. Barclay,

Thos. Wilson,

E. F. Davis,

William Nelson,

James Morris,

W. A. Redman,

T. G. Wilson,

S. B. Leedy.

John B. Phillis,

Sam'l. E. Wilson,

Henry Stool,

F. M. Word,

J. E. Spiller,

Samuel Wilson.

CUSTOM HOUSE, GLOUCESTER. *January 8, 1872.*

DEAR GENERAL: Enclosed please find a memorial for the establishment of a Signal Station at Gloucester. The names could be increased to thousands, but it was deemed sufficient to have the endorsement of the principal fishing owners, and those directly interested. Our people are much pleased at the prospect of the establishment of the station. * * * There are about seven thousand arrivals in Gloucester Harbor during the season, a large proportion seeking shelter. Vessels bound south, coastwise, usually make Cape Ann, and, if the weather promises fair, keep on over the shoals: in case of a storm they put into Gloucester. Vessels bound out or into Boston, often seek shelter here. For our fishermen the signals will be invaluable.

Very respectfully, your obedient servant,

F. J. BABSON.

To Hon. B. F. BUTLER,

Washington, D. C.

—

We, the undersigned citizens, vessel-owners and mariners of the town of Gloucester, deply appreciating the interest that has led to the establishment of Weather Signal Stations for the benefit of the marine service, would most respectfully represent that the harbor of Gloucester is one of the most available for shelter on the New England coast, and that the establishment of a station at this port would be of immense value to all vessels entering Massachusetts Bay, as well as to our local commerce.

In view of these facts, we would respectfully ask that *a station be established at Gloucester*, as at no point will the interests of humanity and enterprise be better served.

Signed by

F. J. BABSON,

and one hundred and sixty-five others.

Endorsed as follows:—

WASHINGTON, *January 13, 1872.*

Respectfully referred to General Myer, with the private letter of Captain Babson, Collector of the Port of Gloucester, showing how important a Signal Station there would be.

BENJAMIN F. BUTLER.

OUR HIGHLY successful, and certainly useful, Signal Service, has still further increased its sphere of beneficence to the commerce of the nation, by adding to the weather reports the depth of water on the Mississippi river and the other navigable streams of the west, the channels of which are constantly shifting. To the pilots of all the steamboats on these uncertain streams the Signal Service Bureau now forwards the daily stages of water on the “bars,” and in the channels both above and below them. This new arrangement cannot fail to prove of immense benefit, not only to the commercial interests of the western rivers, but aid materially in rendering human life safer on the streams where it has hitherto been left to the blind mercy of chance and the mad freaks of criminal recklessness.—*Philadelphia Inquirer*, *January 13, 1872.*

Now that the Lighthouse Board have commenced constructing a lighthouse on Body Island, one of the most dangerous points on the Atlantic coast, and upon which, since the war, over ten millions' worth of property has been lost, the subject of running a line of telegraph from Norfolk to that point, via Cape Henry and Cape Hatteras, is beginning to attract considerable attention from our shippers and underwriters. The immense benefit to com-

merce which has resulted from the timely warnings of the Storm Signal Bureau are recognized, but it is claimed that upon these points, the most dangerous on the coast, the storm signals should also be displayed. A timely warning to vessels passing out at Cape Henry would, no doubt, be of great advantage to the shipping interest, while, in the event of a vessel going ashore, assistance could be sent from Norfolk many hours in advance of the present method.

It seems to us that a Storm Signal Station should also be established at Hampton Roads. It is well known to be one of the finest harbors in the world; and during the prevalence of storms, or easterly weather, as high as one hundred and fifty vessels may be seen at anchor at one time. There is a station in Norfolk, fifteen miles distant, but to these vessels it is practically of no use.—*Baltimore American*, January 13, 1872.

INDEX.

	PAGE.
Alabama, - - - - -	3
California, - - - - -	3
Connecticut, - - - - -	9
District of Columbia, - - - - -	9
Georgia, - - - - -	17
Illinois, - - - - -	19
Iowa, - - - - -	37
Indiana, - - - - -	40
Kansas, - - - - -	41
Louisiana, - - - - -	42
Maine, - - - - -	48
Maryland, - - - - -	52
Massachusetts, - - - - -	60
Michigan, - - - - -	69
Minnesota, - - - - -	72
Missouri, - - - - -	72
Nebraska, - - - - -	81
New Jersey, - - - - -	83
New York, - - - - -	86
North Carolina, - - - - -	137
Ohio, - - - - -	138
Pennsylvania, - - - - -	146
Rhode Island, - - - - -	153
South Carolina, - - - - -	154
Tennessee, - - - - -	162
Texas, - - - - -	165
Vermont, - - - - -	169
Virginia, - - - - -	171
Wisconsin, - - - - -	176

APPENDIX.

	PAGE.
Arkansas, - - - - -	191
California, - - - - -	198
Connecticut, - - - - -	193, 194, 196
Georgia, - - - - -	184
Illinois, - - - - -	188, 191, 199
Maine, - - - - -	183
Michigan, - - - - -	182
Massachusetts, - - - - -	201
Ohio, - - - - -	181
Pennsylvania, - - - - -	202
South Carolina, - - - - -	184
Virginia, - - - - -	202

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